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THE TECHNOLOGY LEAGUE

The following circular letter was mailed to all graduates and non-graduates of the Institute, for whom there were adequate addresses, early in August. The response has been very gratifying.

THE TECHNOLOGY LEAGUE

GENERAL COMMITTEE

FRANK L. LOCKE, '86,
CHAIRMAN

EUGENE C. HULTMAN, '96, SECRETARY
P. O. BOX 5329, BOSTON, MASS.

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FRANK G. STANTIAL, '79

*Formed to oppose the contemplated alliance with
Harvard University, or any similar alliance, to de-
fend the educational freedom of the Massachusetts
Institute of Technology, and to promote the influence
of the Faculty and Past Students in its government*

ISAAC W. LITCHFIELD, '85
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WALTER H. KILHAM, '89
JOSEPH H. KNIGHT, '96
J. ARNOLD ROCKWELL, '96,
LEONARD P. WOOD, '01

Dear Sir:

The Corporation of the Institute, at a meeting held on June 9, 1905, voted "That the Executive Committee be requested, when they may ascertain that the Institute has power to sell the land on which it now stands, to propose to Harvard University an agreement upon the terms of the tentative plan now before this Corporation." The vote stood 23 to 15 in a body with a total membership of 47.

This action was taken after the Corporation had re-

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quested and received the opinions of the Faculty and Alumni on the proposed agreement. The Faculty, after an exhaustive study of the educational advantages and disadvantages of the plan, had declared by a vote of 56 to 7 that it was educationally unsound, and the Alumni, after the full presentation of all arguments, had also registered their disapproval of the plan, the graduates by a vote of 1,351 to 458, the past students (not graduates) by a vote of 684 to 376. Finally, a strong minority of the Corporation, including nearly all of those who have long been intimately connected with the Institute, actively opposed the plan and voted against its adoption, regarding it as financially disadvantageous, and damaging to the cause of technological education.

A majority of the Corporation thus proposes to break with the successful experience of the past and to adopt a radical change of policy against the judgment of the Faculty, through whom the Institute has achieved its pre-eminence in the scientific world and who are most competent to decide the educational questions involved, and of the Past Students, whose knowledge of the Institute has been most intimate and upon whose work the Institute depends for the maintenance of its reputation before the public. Such extraordinary exercise of corporate power, in marked disregard of the moral obligation to respect the opinions and desires of those directly interested in the welfare of the Institute, raises a question more important even than the abandonment of its independent educational policy.

Before the proposed agreement can be consummated, there will be necessary at least three decisions by the Supreme Judicial Court upon the grave legal questions involved, action by the Harvard authorities and possibly further consideration by the Corporation of the Institute, and

an appeal for legislative sanction. The Technology League has therefore been organized to oppose the plan of alliance under consideration, or any other plan which may impair the self-government of the Institute, and to secure for the Past Students a proper share in its administration.

The League has retained counsel to conduct whatever litigation may be deemed advisable in opposition to the agreement. It further proposes to take such steps as may be necessary to secure for the Alumni an effective voice in the administration of the Institute, and to take such other action as shall from time to time seem desirable.

We trust you approve the purposes of the League, and will fill out and mail the enclosed card to the Secretary immediately.

For the General Committee,

E. C. HULTMAN, *Secretary*,
P.O. Box 5329, Boston, Mass.

Boston, August 1, 1905.

THE SUPREME COURT DECISION
RELATIVE TO THE BOYLSTON STREET LAND OF THE
INSTITUTE OF TECHNOLOGY

Following is the full text of the decision rendered by the Supreme Judicial Court of Massachusetts, Sept. 6, 1905, in the suit brought by certain abutters to restrain the Institute from erecting further buildings upon the Boylston Street campus:—

WILSON v. MASSACHUSETTS INSTITUTE OF TECHNOLOGY
WELLS v. SAME

SUFFOLK.

Sept. 6, 1905.

EQUITY—ENFORCEMENT OF EQUITABLE RIGHTS BY ABUTTERS—GRANT
BY LEGISLATURE—RESTRICTIONS

LORING, J.—These are two bills in equity reserved for the consideration of the full court upon the pleadings and agreed facts. They are brought by owners of two lots of land on Newbury Street, in the city of Boston, facing the square on which the buildings of the defendant Institute and those of the Society of Natural History now stand, for the purpose of having the defendant Institute enjoined from covering with its buildings more than one-third of the land “granted” to it by St. 1861, c. 183, as it is authorized to do by St. 1903, c. 438, “subject to the rights, if any, of other parties.” The bills proceed on the ground that by the sale of these and other lots surrounding the square under this act (St. 1861, c. 183) an equitable restriction was imposed upon this square for their benefit, which includes the right they now seek to enforce.

By ss. 1 and 2 of St. 1861, c. 183, the defendant Institute is incorporated. By s. 3 it is provided that the square in question “shall be reserved from sale forever, and kept as an open space or for the use of such educational institutions of science and art as are hereinafter provided for.” By s. 4 it is provided that the defendant Institute shall hold, occupy, and control the westerly two-thirds of said square, subject to the “stipulations” specified; and by s. 5 it is provided that the Boston Society of Natural History “shall be entitled to hold, occupy, and control” the easterly one-third on certain provisions there specified. By s. 6 it is provided that the rights and privi-

leges given in the last two sections are granted subject to certain "further conditions" there specified. Then comes the section which is here relied on by the plaintiffs; to wit, "The above-named societies shall not cover with their buildings more than one-third of the area granted to them respectively." By ss. 8 and 9 the commissioners on the Back Bay are "instructed to reserve from sale the lots fronting on said square on Boylston, Clarendon, and Newbury Streets until said societies shall, by enclosure and improvements, put said square in a sightly and attractive condition," and that an appraisal should be made of all the surrounding lots (except those on Berkeley Street, which had been already sold) and of the square in question; and, if the surrounding lands, when sold, do not equal the appraised value of the two (the surrounding lots and the square), the two societies shall pay the amount of the deficit to the Commonwealth for the school fund, to which the proceeds of the sale of these lands had been appropriated by the Legislature.

St. 1861, c. 183, was enacted on a petition asking for the "incorporation of an institution to be entitled the 'Massachusetts Institute of Technology,'" and that "a section of land on the Back Bay may be reserved and granted to the use of said Institute on such terms and conditions as may be deemed most conducive to the objects of the Institute and the industrial and educational interests of the Commonwealth," and on a petition by the Boston Society of Natural History asking for a similar grant. These petitions were referred to the joint standing committee on education, who made a report set forth in the agreed facts, hereinafter set forth in part in this opinion. This committee reported a bill which is not made a part of this case, but "shortly afterward the act of St. 1861, c. 183, was passed" on April 10, 1861.

On Sept. 5, 1861, the appraisal called for by s. 9 was completed; and the land in the square and the land in the surrounding lots on Boylston, Newbury, and Clarendon Streets was appraised at \$1.05 a foot.

A word as to what the Back Bay lands were will explain the occasion of the "grant" to these petitioners.

What is now known as the Back Bay District of Boston was originally flats covered by the ebb and flow of the tide, and used for mill purposes. It became desirable to change the use of these flats from mill purposes to land purposes. The title to these flats was in the Commonwealth and the companies which owned the right of flowage for mill purposes. Prior to 1857 the Commonwealth had by an adjustment got title to all the land shown on the following plan which was adopted by the Back Bay commis-

sioners appointed under Resolve, 1852, c. 79, and annexed to their fifth annual report rendered in January, 1857. It had determined to fill and sell these lands, and had laid out the land for that purpose by the adoption of this plan. See *Commonwealth v. Roxbury*, 9 Gray, 45; Fifth Annual Report of the Commissioners on the Back Bay; Report of the Commissioners appointed under Resolve of 1856, c. 76, with accompanying documents, printed in Senate Doc. No. 17, for the year 1857; Resolves, 1852, c. 79; 1855, c. 60; 1856, c. 76; 1857, c. 70; Sts. 1857, c. 169; 1859, c. 154; 1860, c. 200, s. 5. The Commonwealth had thus come into an extensive territory from the sale of which a large profit was expected to result after the cost of filling had been met. In 1861, when the act in question was passed (St. 1861, c. 183), these flats or lands were "being filled, but at that time, with other large tracts to the west and south, were almost entirely vacant, the residence portion of the city being east of Arlington Street, and the business portion still more to the east."

The lots surrounding the square in question (forty-six in number) were sold at four different auction sales, severally held on Sept. 29, 1863, May 19, 1864, October 26, 1865, and April 10, 1869. The lot now owned by the plaintiff Wilson was bought at the second, and the lot now owned by the plaintiff Wells at the third, of these sales. A plan annexed to the agreed facts sets forth the actual price received by the Commonwealth from the sale of the forty-six surrounding lots. It is stated by the plaintiffs and not contradicted by the defendant that this plan shows that these forty-six surrounding lots were sold for \$2.46½ a foot, and that the Commonwealth received from these sales \$90,384.06, over and above the appraised value of the square here in question, plus the appraised value of the surrounding lots made under s. 8 of St. 1861, c. 183.

As both the plaintiffs, on the one hand, and the defendant, on the other hand, have sought support from the way these sales were conducted, a short statement of it is necessary.

The surrounding lots consisted of twenty-two on Boylston Street, twenty-two on Newbury Street, and two on Clarendon Street. The lots fronting the square on Berkeley Street had been sold before St. 1861, c. 183, was enacted, as we have already said; and, as we have said, all that were sold after that act were sold at public auction. Those on Boylston Street were sold on Sept. 29, 1863. The twenty-two lots on Newbury Street were offered for sale on May 19, 1864; and fifteen of them were sold then. The remaining seven were sold on Oct. 26, 1865, and the two lots on Clarendon Street were sold on April 10, 1869.

In case of all forty-six lots the purchaser took a bond for a deed, followed by a conveyance later,—in one instance twenty-eight years later. The explanation for this course of conducting the transaction is obvious. So long as the title to it stood in the Commonwealth, a lot of land was not subject to taxation by the local authorities.

The four auction sales were advertised. The advertisements of the sales at which the two lots now owned by the plaintiffs were bought ended with this statement: "Catalogues with plans showing the situation and area of the several lots to be sold, and the minimum price of each, together with form of deed to be given by the commissioners and full particulars in regard to the restrictions and stipulations to be incorporated therein may be obtained" at the office of the commissioners.

The catalogue in case of the first of these two auction sales (the second of the four) covered lots on Commonwealth Avenue, as well as the twenty-two lots in question on Newbury Street; and in case of the second of these two sales (the third of the four), besides the seven lots here in question, other lots on Newbury Street and lots on Commonwealth Avenue and Beacon Street.

The plan referred to in the concluding paragraph of the advertisement was pasted inside the catalogue. It was the only statement contained in the catalogue of what was to be sold and of the upset prices fixed by the commissioners with the approval of the governor. It was not otherwise referred to in the catalogue. A copy of the plan so referred to in the advertisement and pasted in the catalogue at the first of these two sales (the second of the four) shows this square laid out as provided in St. 1861, c. 183, and is as follows: The plan referred to in the advertisements and pasted in the catalogue at the second of these sales (the third of the four) was the same as the one above set forth, with this difference: In the one used at the later sale the names of the purchasers of the several lots sold at the former sale were added. The plans used at the first and fourth sales were also the same, with similar differences as to the absence or presence of the names of purchasers of lots.

The form of deed referred to in the catalogues for the first three of the above four sales was a printed form adopted prior to St. 1861, c. 183, and apparently used for the sale of all lots on the Back Bay indifferently. It referred to the plan of 1857 alone. It will be observed that on this plan the land is not divided into lots. After November, 1866, the form of deed set forth in the catalogues referred "also to the plan recorded with Suffolk Deeds at end of Book 885," which is, in fact, a plan showing the square

here in question, laid out as provided in St. 1861, c. 183. Of the forty-six lots here in question, only two—namely, those on Clarendon Street—were sold under such a catalogue.

Two plans were referred to in the bonds for a deed given for all the lots except those given for three; namely, the plan of 1857, above set forth, and a sale plan of lots on Commonwealth Avenue and Marlborough Streets, recorded Nov. 5, 1860, Book 788, p. 159, which apparently differs from the plan of 1857, in showing the division of the land into lots. The reference to these plans was a part of the printed form of bond used for Back Bay lots generally. In case of the other three lots (not including, however, either of the two here in question) the second of the above plans was not referred to; and the plan showing the square here in question laid out as provided in St. 1861, c. 183, was referred to as well as the plan of 1857.

In the deeds of sixteen of the lots on Boylston Street, the only plan referred to is the plan of 1857. In the other six the other plan set forth in this opinion is also referred to, showing the square in question laid out as provided by St. 1861, c. 183. In case of Newbury Street the deeds of twelve lots refer to the 1857 plan only, while both plans set forth in this opinion are referred to in the deeds of the other ten lots, including the lots now owned by the plaintiffs.

All the forty-six surrounding lots are now built upon. The buildings on Boylston Street are occupied "by the Young Men's Christian Association and for sundry mercantile uses, by the Hotel Brunswick, and by four dwelling-houses used for residences"; the lots on Clarendon Street by apartment houses, the one on Boylston Street having "stores beneath"; those on Berkeley Street by a private apartment house, and by an apartment and mercantile building; and those on Newbury Street, as follows: corner of Newbury and Berkeley Streets by a church; the next seven, by dwelling-houses used as residences; the next by a club-house; the next, No. 85, by a doctor's office and lodging-house (which the owner "intends within a few months to occupy . . . again for a residence as well as for his office, as formerly"); the next, by a lodging-house; the next four, by residences (in the last of which the owner also "carries on her business as a dressmaker, and lets rooms for doctors' offices"); the next, by a lodging-house; and on the other corner is the rectory of Trinity Church.

The contest here is on the application of well-settled principles of law to new surroundings.

Counsel for both parties agree that it is not necessary to decide whether the effect of St. 1861, c. 183, was to convey to the two societies the fee in

the square in question or only certain rights of occupation, the fee being retained in the Commonwealth. If we speak of the grant as one or the other, it will be for convenience only, and not as expressing any opinion on this point.

We agree with the counsel for the defendant in their contention that, if St. 1861, c. 183, was not intended to give to persons buying the surrounding lots under it the right here claimed by the plaintiffs, they cannot make out a case because of the form given to the transaction by the officers of the Commonwealth. If St. 1861, c. 183, was not intended to give such a right, such acts of these officers would not bind the Commonwealth on the principle lately enforced in *Wormstead v. Lynn*, 184 Mass. 425.

In construing this act, the first fact, and the most important consideration, is that the grant to these two societies was not to cost the Commonwealth a penny, and that this was to be effected by dealing with the square granted to the societies in such a way as so to enhance the value of the surrounding lots that they would yield as much as or more than the aggregate value the two had under the conditions prevailing before St. 1861, c. 183, was enacted. And it is perhaps of some interest that this scheme was suggested to the Commonwealth by the petitioners for these grants, including among them the petitioners for the incorporation of the defendant Institute.

It is stated in the report of the committee of the legislature to whom these petitions for a grant of land were referred, "According to the plan of the Memorialists, sufficient space is to be reserved to leave wide openings around the buildings of the societies." And, again: "Common experience shows that such open ornamental grounds surrounding the buildings, together with the attractive exterior of the latter, could not fail to increase the value of the adjacent lands, and to this extent would reimburse the treasury for the space withdrawn from sale. As regards the amount of this enhancing influence, your committee have been furnished by the Memorialists with a large array of facts derived from the sales of lands on the Back Bay and other open parts of the city, going to show that improvements of the kind contemplated have been found in every case, not only to hasten the sale and occupation of the adjacent lands, but to add very largely to their market value, making the net proceeds of the adjacent lands in most cases as great or even greater than the value of the total area, supposing no such reservation to have been made."

St. 1861, c. 183, adopted to carry into effect this scheme of the "memorialists" (including the defendant Institute), provided (first) that the square in question "shall be reserved from sale forever"; (second) "and

kept as an open space for the use of" the two societies; and (third) "the above-named societies shall not cover with their buildings more than one-third of the area granted to them respectively." The plaintiffs contend that these declarations were addressed to the purchasers of the surrounding lots as the basis on which those lots were to be sold, and were made for the benefit of such purchasers, and that, having bought on the faith of them, these purchasers are entitled to have them specifically enforced.

The defendant, on the contrary, insists that on a fair construction of the provisions of the act the legislature intended to keep, and did keep, the control of all restrictions in its own hands, and that the value of the surrounding lots was to be enhanced by the square in question, being physically laid out before they were sold, and that the square was to continue in that condition so long as the Commonwealth, having regard to the interests of all concerned, should think it ought so to continue, and no longer; that St. 1903, c. 438, was an exercise of the control so reserved, and brought to an end as of right the advantages for which the purchasers of the surrounding lots paid an enhanced price.

When the defendant contends that in St. 1861, c. 183, the legislature kept the control of the whole situation in its own hands, it relies on the fact that, having regard to the words "further conditions" in s. 6, what are called "stipulations" in s. 4 are really conditions, and, being conditions, the subject-matters covered by them are matters between the Commonwealth and the grantees, and between them alone.

Were that the whole story, the result would not necessarily follow. The fact that a provision of a deed is put in the form of a condition, and in no other form, even when coupled with an express statement that the "non-fulfilment or breach" "shall work a forfeiture of the estate hereby conveyed, and reinvest the same in the grantor," is not decisive against its operating as an equitable restriction in addition to its operating as a common law condition. That was decided in *Hopkins v. Smith*, 162 Mass. 444, and is laid down in the recent case of *Welch v. Austin*, 187 Mass. 256, 258. The same principle would govern in case of a grant made by act of the legislature.

The doctrine of *Hopkins v. Smith* is that in spite of the parties to a deed having put the thing agreed upon in the form of a common law condition, and a common law condition only, the question whether it does not operate also as an equitable restriction is one of intention. The fact that the thing agreed upon has been put in the form of a common law condition, and in that form alone, is of itself a matter to be taken into consideration in arriv-

ing at the intention of the parties. But that fact has no greater or further effect. The opposite results severally reached in the cases of *Peck v. Conway*, 119 Mass. 546, and *Clapp v. Wilder*, 176 Mass. 332, are examples of the application of this rule.

The cases of *Episcopal City Mission v. Appleton*, 117 Mass. 326, and *Skinner v. Shepard*, 130 Mass. 180 (as to which see *Welch v. Austin*, 187 Mass. 256, 259), would raise an additional difficulty in construing the matters covered by s. 4 to be equitable restrictions as well as conditions, if the provisions of s. 4 were what is here relied on by the plaintiffs as the creation of the equitable restrictions insisted upon by them. That additional difficulty consists in the fact that s. 4 deals alike with matters with which the purchasers of surrounding lots have nothing to do and with enclosing, adorning, and cultivating the open ground around its building, and thereafter keeping said ground and building in a sightly condition. We refer to the "stipulation" that "persons from all parts of the Commonwealth shall be alike eligible as members of said Institute or as pupils for its instruction; and its museum or conservatory of arts, at all reasonable times, and under reasonable regulations, shall be open to the public." But, as we shall see, s. 4 and its provisions are not what the plaintiffs rely upon.

We come, then, to the question of the construction of the act, St. 1861, c. 183.

In the first place, it is provided (and this provision is in s. 3, and is not one of the "stipulations" of s. 4, nor one of the "further conditions" of s. 6) that the square in question "shall be reserved from sale forever."

It is true that the only thing here complained of is a threat by the defendant Institute to build over more than one-third of the area granted to it. But the right to build over more than that area and the right to sell the whole area to others to be built over by them is treated in St. 1861, c. 183, as one and indivisible; and no distinction is made in St. 1903, c. 438, between the right to build over the whole area and the right to sell the whole area to others to be built over by them. The two rights alike are granted to the defendant Institute by the act of 1903. The true construction of St. 1861, c. 183, cannot be determined without considering the validity of the provision of St. 1903, c. 438, which permits the sale by the defendant Institute of the whole area to others, to be built over by them.

In construing St. 1861, c. 183, we start first with a declaration that this square was "to be reserved from sale forever." And, having in mind the purpose for which St. 1861, c. 183, was enacted, we are of opinion that this was a declaration addressed to future purchasers of surrounding lots, to

induce them to pay for those surrounding lots more than they otherwise would pay for them.

We next come to the declaration that the square which is "to be reserved from sale forever" is to be "kept as an open space or for the use of" the two societies, and that "the above-named societies shall not cover with their buildings more than one-third of the area granted to them respectively." These provisions state the details of what is to be done with this square which is "to be reserved from sale forever," and like that declaration are addressed to future purchasers of surrounding lots. Being details, the duration of them is fixed by that of the main provision of which they are details, unless there is something to control that result.

It is of importance that these provisions are not found among the "stipulations" of s. 4, nor among the "further conditions" of s. 6, but are in separate sections (ss. 3 and 7), which are not put directly or indirectly in the form of conditions. The case now before us, therefore, is not such an extreme case as *Hopkins v. Smith*, where there was no provision outside of or in addition to the condition which was coupled with an express defeasance and right of re-entry.

In the case at bar the broad principles on which the surrounding lots are to be sold are stated in sections (ss. 3 and 7) addressed to the purchasers of them; and these are not put in the form of conditions. In addition we have ss. 4 and 6, which are put in the form of conditions. These sections deal (*inter alia*) with the machinery adopted for carrying into effect the details of the broad principles stated in ss. 3 and 7.

Apparently, the legislature thought that the best results could not be secured to the purchasers of surrounding lots unless some one person or body could act for all of them in matters of detail, and for that reason it intrusted the matter of dealing with the details to the Governor and Council. Apparently, the legislature further thought that the best way of enforcing compliance with directions as to details so made was to give to the Governor and Council a right of re-entry on non-compliance with the directions adopted by them; and it gave such a right of re-entry. But that did not interfere with the declarations (on which these surrounding lots were to be sold) constituting a right in the purchasers of them,—namely, that this square was "to be reserved from sale forever"; and, if not used as an open space, it was not to be covered by buildings to an extent greater than one-third of its area. The result is that the design of the buildings to be erected, the laying out of the grounds, and the proper maintenance of both are matters left to the discretion of the Governor and Council. But the broad prin-

ciples were not left to them. Under St. 1861, c. 183, the Governor and Council were authorized to approve such a building as they saw fit; and they might give their approval to what might be thought by others to be the laying out of the grounds in a way injurious to the surrounding residences, and they might allow the grounds to fall into what might be thought by others to be a deleterious state of maintenance. On these matters of detail their decision, honestly exercised, is final. But they have not now and never had jurisdiction to abridge the rights of the purchasers of surrounding lots: (first) to have the square "kept from sale forever"; and (second), in case it is not used as an open space, to have the buildings of the two societies not cover "more than one-third of the area granted to them respectively." Such, in our opinion, was the intention of the legislature in enacting St. 1861, c. 183; and that is what the legislature provided by that act.

It is true that St. 1863, c. 226, repealed ss. 8 and 9 of St. 1861, c. 183, requiring the two societies to make good the deficit in case the amount realized from the sale of the surrounding lots under St. 1861, c. 183, did not equal the value of those lots plus the value of the square here in question before St. 1861, c. 183, was enacted, and that all the lots (with the exception of those on Berkeley Street sold before the enactment of St. 1861, c. 183) were sold after the repealing act of 1863. But the repeal of these sections was not intended to change the scope of the act (St. 1861, c. 183). It was intended to release the societies from a burden which was assumed—and rightly assumed—to have ceased to exist. As was said by the commissioners in their report of 1863, when speaking of the sales made in the previous year, the "policy of this repeal was justified by the sale" on account of the great rise above the appraised values,—a rise which was created by the scheme of St. 1861, c. 183, in favor of the surrounding lots.

We are of opinion that on the facts stated the plaintiffs have sustained the burden of proving that the surrounding lots generally, and the lots now owned by them in particular, were sold and bought under St. 1861, c. 183, and that they became entitled by such purchase to the benefits granted to them by that act, including the right to have the buildings of the defendant corporation confined to an area not exceeding one-third of the land assigned to it by St. 1861, c. 183.

Although the Commonwealth is a sovereign State, it can no more change the grant thus made than can an individual. That has been the law, at least since *Dartmouth College v. Woodward*, 4 Wheat. 518.

We see nothing in the agreement of the parties that should disentitle

the plaintiffs from having this agreement specifically enforced. What that agreement amounts to is that the square in question would have a greater market value than it has if the surrounding lots had not been sold on the terms on which they were sold. The plaintiffs have a right to use their property as they please, even if that property would have a greater value if devoted to another use. The facts agreed to do not bring the case within the doctrine of *Jackson v. Stevenson*, 156 Mass. 496, nor within the concluding paragraph of the opinion in *Parker v. Nightingale*, 6 Allen, 341, 349.

The plaintiffs are severally entitled to a decree with costs, enjoining the defendant from proceeding with the erection of any building or buildings covering more than one-third of the area assigned to it by St. 1861, c. 183. So ordered.

Dissenting. Justices Morton and Hammond dissent. They think that the square occupied in part by the defendant is not subject to any equitable or other restrictions in favor of the plaintiffs or surrounding lot owners, and that the bills should be dismissed.

(Chief Justice Knowlton being a member of the Technology Board, *ex officio*, did not take part in this opinion.)

JOHN C. GRAY,
EDWARD L. RAND,

AND

ROLAND GRAY,
For Plaintiffs.

GEORGE PUTNAM

AND

WILLIAM L. PUTNAM,
For the Defendant.

SHALL THE UNIVERSITY BECOME A BUSINESS CORPORATION

EXTRACTS FROM AN ADDRESS BY HENRY S. PRITCHETT.*

To-day, in the United States, two radically different plans for the support and conduct of higher institutions of learning are in process of development,—the one that of the private university, the other the university supported and controlled by the State. . . .

These two systems of universities rest upon fundamentally different views as to the support of higher education. The one assumes that this support will come by the free gift of citizens of the Commonwealth, the other assumes that the support of higher education no less than that of elementary education is the duty of the State. . . .

As far as one can see into the future, both of these systems will continue to live and to flourish, but with few exceptions they will flourish in different sections, not side by side. No one can doubt to-day that the State university is gaining as a centre of influence in intellectual and national life. . . .

Wide apart as are these two systems of universities, they are singularly alike in the form and method of administration, and singularly unlike in this respect to the universities of other lands,—for example, to those of Germany and of Scotland. . . .

The American university, whether supported by private gift or by the State, is conducted under an administrative system which approximates closer and closer as time goes on to that of a business corporation. The administrative power is lodged in a small body of trustees or regents, who are not members of the university community. Their chief point of contact with the university (that is, with its teachers, students, and alumni) is through the president, whose power is often autocratic.

In other countries, as in Germany for example, the university, so far as its internal control and administration is concerned, is a free association of teachers and scholars. Its chief executive officer is elected by the faculty itself from their own number. The question of the choice or the dismissal of professors is not brought before any outside body. The faculty and

*Delivered at the University of Michigan, June, 1905. Reprinted, by courteous permission, from the *Atlantic Monthly*, September, 1905.

students together form a self-governing democracy, and an officer with the autocratic power of an American college president would seem to them intolerable. It is an interesting fact that in Germany, a country which is politically governed by an autocrat, the representative institution of learning is a republic, while in America, where we pride ourselves on our democracy, our representative educational institution is administered upon autocratic, not upon democratic lines.

For the sake of clearness let us sketch briefly the two systems of administration. The European university must always be considered from two standpoints, first that of a state establishment, second as a self-governing body of scholars. As a state institution, the university is under the control of the ministry, which furnishes the budget, keeps account of the finances, and conducts the routine business connected with the financial side of the institution. As an institution of learning, however, its fundamental idea is freedom,—freedom of teaching, freedom of learning. The teacher has a freedom which no officer or student may invade. The student, on the other hand, has a freedom of learning which no teacher and no officer may invade. The faculty elect their own officers. When a new member of the faculty is to be elected, he is nominated by the faculty, and freedom of teaching is guaranteed to him in the noble words of the German constitution: "Die Wissenschaft und ihre Lehre sind frei,"—"Science and its teaching are free." And that freedom is sometimes carried to a length which we, in this country, would consider impossible. . . .

In comparison with this administration, whose watchword is freedom, the American university has tended more and more to conform in its administration to the methods of the business corporation. In the organization of a railroad the government consists of a president and a small board of directors, who choose officers, promote or dismiss them, and determine the absolute policy of the corporation. The administration of the university has assumed practically the same type. The board of trustees, even in our older colleges and universities, is chosen almost entirely from business men and on the basis of business experience. It is no longer considered necessary that the president should be a scholar. The board of trustees, with the president as its chief executive officer, passes upon the entire policy and administration of the institution. It appoints professors, promotes them, or dismisses them, it engages them to carry out specific pieces of work at specified times, as a business corporation employs its officials. The tenure of office of the professor is at the will of the corporation, as is the tenure of office of a business employee. Under this arrangement the

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powers of the president are enormously increased, and the action of the corporation is in nearly all cases his action. He possesses an autocratic power which would not for a moment be tolerated in a European institution. From him the same administrative system reaches down through the institution. Professors employ their assistants for specific duties at specified times: students are required to undertake specific work in a prescribed way and at a fixed time. . . .

To sum up the difference between the administrative systems of European and American universities, the essential contrasts between the two seem to be these: the one is democratic, the other autocratic; in the one the tendencies are toward individualistic power and influence, in the other the tendencies are toward centralized power; the one has for its watchword freedom,—freedom for the teacher, freedom for the student,—the other has for its watchword responsibility to the administration; one invites students to study, the other organizes them for graduation.

In this brief sketch I do not mean to be understood as painting in terms too glowing the tendencies of the foreign institutions, or as wishing in any way to conceal their faults and their shortcomings, which are evident enough. . . . [After pointing out the defects of the German system, the address continues]

Notwithstanding these evident defects, the system as a whole—the university as a republic of scholars—has worked well. It has resulted, in the main, in the choice of the right men for the right places, which is the real object of university administration. . . . And, on the whole, it may be fairly reckoned that a system in which the administration rests partly on the teacher and partly on the outside administrative officer contains influences which are calculated to correct the faults of each. . . .

It is not my purpose, in making this comparison, to urge the adoption in our American universities of the foreign system. . . . My wish is rather to call attention to the tendencies of the system under which we are developing. . . .

Would the American university—whether a private or a State institution—be bettered if its administration were turned over to the faculty instead of being vested, as now, in a board of trustees who do not pretend to be experts in educational methods? Would it be a step forward, for example, to intrust to the faculty the election of the president and of the professors, and to put into their hands the settlement of the larger questions of policy and of expenditure? Ought the university freedom to be extended through the faculty to the student body, so as to diminish the pressure of the or-

ganization and to enlarge the sphere of freedom both for professor and student? Can scholarship of a high order be developed under pressure? Are we educating our youth away from democratic ideals, not toward them by the form and tendency of our university administration? . . .

I believe thoroughly that these questions are real ones and important ones, and that the sooner we have them clearly and definitely before our eyes the better it will be for university development in this country. However important it may be to have a man of affairs at the head of university administration, it seems to me clear that the first requisites are a scholarly spirit and scholarly sympathy. However we may admit that team work is a part of the régime of the day, it is surely true that the use of the principle is very different in an institution of learning from that which obtains in a manufactory. . . .

In the settlement of the larger questions of administration—the choice of president and of professors, the fixing of greater questions of policy—may not some council composed of trustees and faculty jointly share the responsibility to advantage? Whatever may be said in favor of the sound judgment of the well-trained business man, I cannot doubt that he would be a wiser councillor for education if he could hear first-hand the views of devoted, intelligent scholars. On the other hand, will not the scholar profit equally by such contact, and is there any surer way to widen his horizon and to give him the experience which ripens judgment than to offer him a share in the responsibility of settling these larger questions, while relieving him at the same time of part of the pressure of the daily routine? In a word, recognition of scholarship in the choice of a president, an adjustment of duties which shall relieve the pressure upon the professor and student, a better contact between the governing body and the teaching body, with a common responsibility in the settlement of the larger questions, seem to me distinct and practical steps in the direction of development which the university administration ought to study.

For one must not forget, in considering the administration of a university, that there are to every form of administration two sides, the mechanical and the spiritual. The mechanical part of administration is that which provides the machinery necessary to carry out a given enterprise. The other side of administration, the spiritual side, consists in getting out of men the best there is in them. . . .

Our attention has been given of late years, in American university life, increasingly to the mechanical side of administration, and the machinery has been made to approximate more and more closely, both in its form

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and in its choice of executive officers, to the practice of the business corporation. Its very closeness and compactness of organization are in some respects its chief faults. That which is mechanical is always simpler than that which is living. To-day we need, in my judgment, to concern ourselves in the university with the spiritual side of administration. . . .

For, after all, we can never too often remind ourselves that the first purpose of the university is not to further industrial development or to increase the wealth of a State, but that it is the development of the intellectual and spiritual life. This development can take place only in the air of freedom, however evident are the dangers which freedom brings with it. Wealth, power, the niceties of life, may all grow in an atmosphere of limited or of artificial freedom, but only in the air of real freedom can be grown that spirit and that intelligence which shall minister to those things which are spiritual, and to those things which are eternal.

A STUDY OF THE INSTITUTE'S EXPENSE ACCOUNT: IS THERE ECONOMY IN EXPANSION?

A question which has developed radical differences of opinion within the Institute body during the past few months is that of the superior economy of giving technological education in one very large institution rather than in two of moderate size. On the one hand, it has been maintained that, unless the quality of instruction is to be sacrificed, the provision of buildings, apparatus, and instructors, must increase directly as the number of students; *i.e.*, that a considerable increase in the number of students would result in no economy. On the other hand, it has been held that, as industrial experience would lead one to expect, if the number of students at the Institute should be largely increased, considerable economies would be possible. On both sides, figures from the reports of the Treasurer have been adduced.* With a view to ascertaining what light upon this question a more extended analysis of the Institute's experience would afford, the following study was undertaken:—

From the annual Treasurers' reports, the earlier ones made available through the courtesy of Mr. F. H. Rand, the Bursar, were obtained the Institute's expenditures for current expense for each year since 1877. The President's report for 1905 contains a table of the number of students in attendance at the Institute each year since the school's foundation. Reducing current expense for each year to expense per student, and putting the results in graphical form, the accompanying diagrams have been obtained.

Diagram I shows the total number of students in attendance, and the total current expense per student, for each year since 1877. The total expense here considered differs from the total of expenses of the Treasurers' reports in that expenditures for the Lowell School of Design, the Society of Arts, and for interest, and awards from the

* TECHNOLOGY REVIEW, April, 1905, Part II., p. 57; Part III., p. 30.

Teachers' and Austin Funds and from funds for fellowships, scholarships, and prizes, have been omitted.* Diagrams II and III show this total expense divided into its principal elements,—salaries for instruction and department supplies† on Diagram II; general expense,‡ salaries for administration and labor, and repairs on Diagram III. Differences in the methods of grouping accounts in the reports prior to about 1884 prevent showing detailed expenditures for the earlier years.

Considering the curves individually, that of total expense exhibits marked irregularities from year to year. With variations so large and so erratic, any generalizations based on a comparison of total expense over a period of two or three years must be futile and illusory. Comparison of Diagram I with Diagrams II and III shows these erratic fluctuations to be mainly in the items of repairs and general expense. By a study of the details of the general expense account these irregularities have been found to be due chiefly to extraordinary expenditures for items of furniture and fixed equipment of buildings. The largest of these expenditures in excess of the normal amount are indicated upon the diagrams, the same item being similarly numbered wherever it occurs.§ If we consider

* These expenditures and awards, which occur irregularly in the different years, are strictly no part of the cost of education. Until 1898 the expenditures omitted were chiefly for interest on the debt. From 1884 to 1891 scholarship awards appear in the Treasurer's expense account, and are here omitted. In recent years Teachers' Fund, Austin Fund, and fellowship awards and prizes comprise the omitted items. In view of the frequent and persistent confusion of deficit with debt it is interesting to note that the debt, which in the early years was so heavy a burden, was completely wiped out in 1900.

† The department supplies account, formerly called laboratory supplies and libraries, includes, besides materials for laboratory consumption and additions to the libraries, all but extraordinary expenditures for instruments, apparatus, and special laboratory equipment.

‡ This includes not only the "general expense" account of the Treasurers' reports, but also expenditures for insurance, fuel, water, gas, electricity, advertising, printing, and all other expenditures for the school as a whole.

§ Item 1, improvements in the chemical and physical laboratories and a new boiler, \$9,137.18, or \$12.69 per student; 2, furniture and fire apparatus and other permanent equipment, about \$5,600, or about \$6.20 per student; 3, new boiler, \$5,000, or about \$5 per student; 4, partly furniture, etc., for Engineering Building B, but principally expenses of exhibiting at the World's Columbian Exposition, about \$9,800, or \$9.25 per student; 5, expense on account of new boiler-house, \$6,723.84, or \$6.73 per student; 6, furniture, electric wiring, and other equipment items

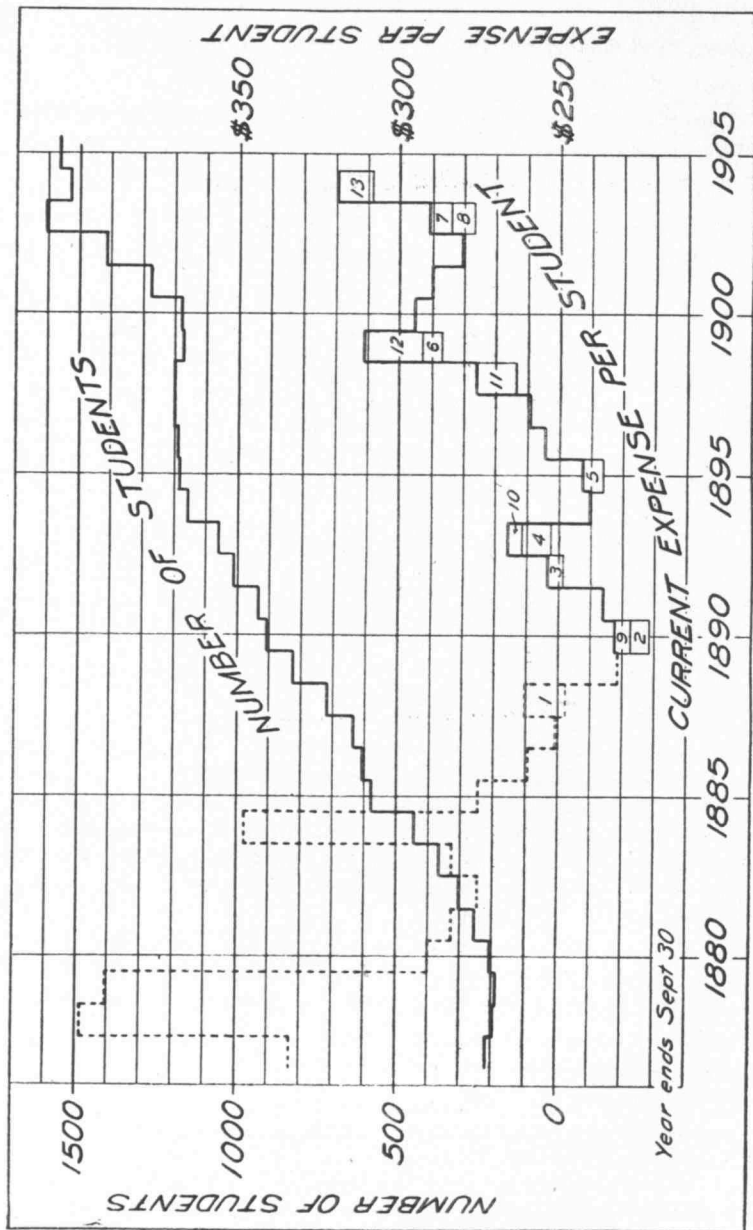


Diagram I.

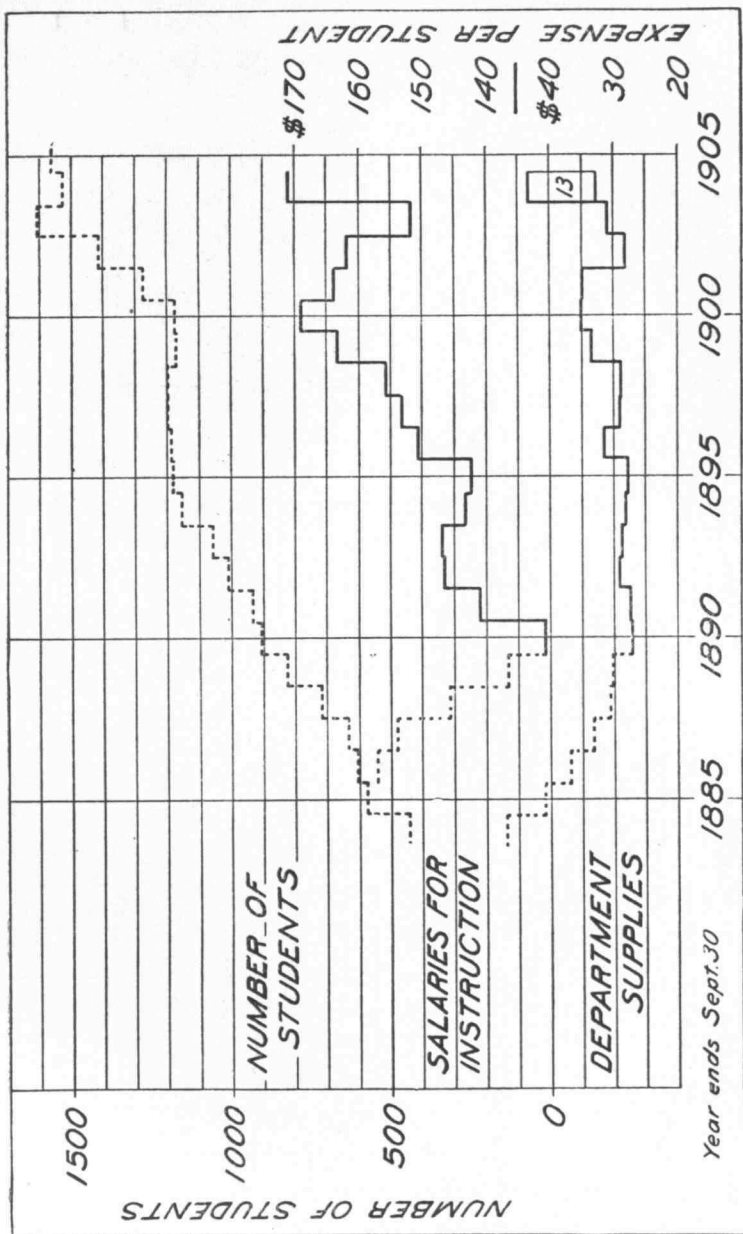


Diagram II.

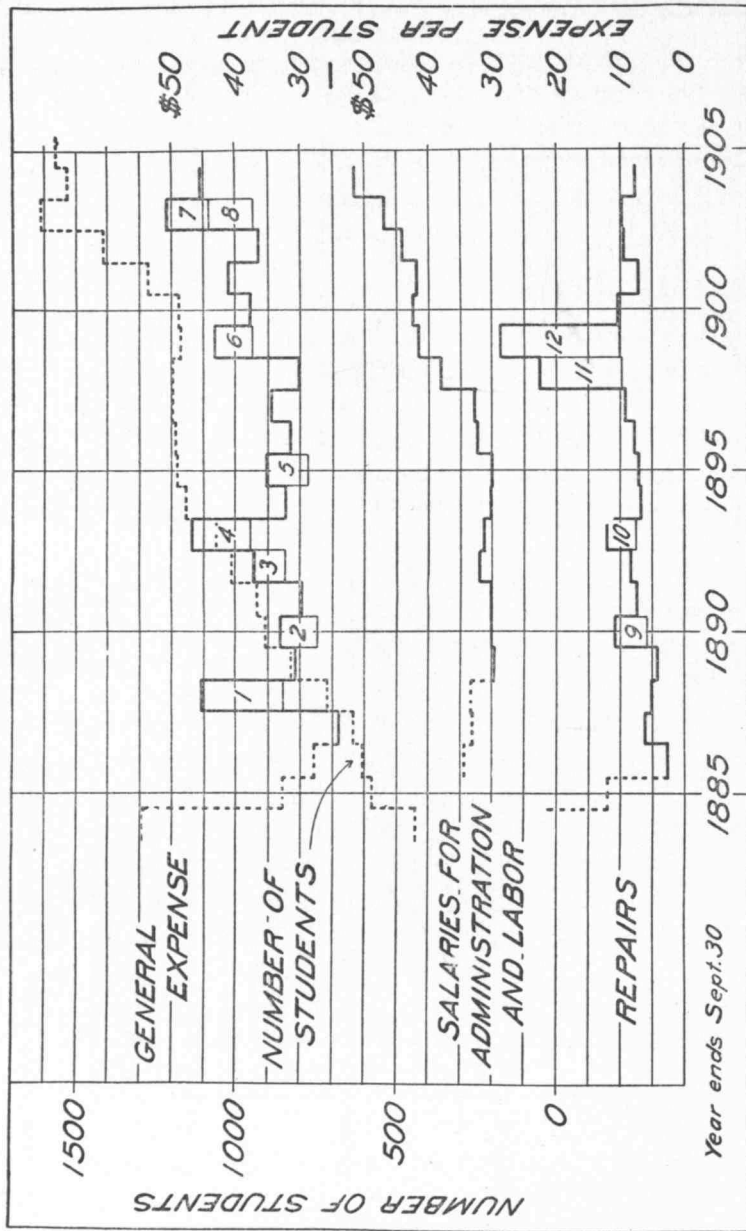


Diagram III.

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these exceptional expenditures deducted from the total expense account, it will be found that salaries for instruction will account for nearly all of the variations which remain.

Considering the modified total expense curve, the most striking fact brought out is the rapid decrease in total expense per student until 1890, and its persistent and relatively steady increase since that date. The decrease was very largely in the item of salaries. These increased in absolute amount much less rapidly than did the number of students, which rose from 215 in 1877 to 909 in 1890,—a gain in thirteen years of nearly 700, or 320 per cent. Total salaries* per student fell meantime from \$273 in 1877, \$304 in 1878, and \$312 in 1879 to \$210 in 1881 and \$166 in 1890. In the fourteen years following, though the number of students increased by 600 to 1,528 in 1904, expenses advanced so much more rapidly that the expense *per student* increased 39 per cent.

A word as to the component items of expense. The largest—salaries for instruction, averaging about 60 per cent. of the total,—increased very steadily from 1890 to 1900, and, after falling until 1903, rose to its highest point in 1904. This increase is due almost wholly to a more liberal provision of instructors, the number of instructors per 1,000 students being 97 in 1889, 115 in 1900, and 122 in 1904. The decline from 1900 to 1903, together with a smaller decline in department supplies, accounts fully for the decrease in total expense per student during this period of exceptionally rapid growth. The reason for this decline is not far to seek. The rapid increase in numbers† from 1900 to 1903 was an increase chiefly in

in connection with the new Pierce Building and the extensive repairs in Rogers, about \$7,000, or about \$6 per student; 7, furniture, wiring, etc., for the new Lowell and Eng. C Buildings, and, 8, extra cost of coal due to the coal strike of 1903, each about \$11,000, or about \$6.80 per student. Items 9, 10, 11, and 12 are extraordinary repairs, items 11 and 12 for the reconstruction of the first floor of Rogers Building. 13 is for items of special equipment to the amount of about \$16,200, or about \$10.60 per student.

* The salary account is not subdivided in the Treasurers' reports prior to 1886.

† This exceptionally rapid increase, especially between 1902 and 1903, was due largely to the effort to enter before the increase in tuition should take place. This increase had been announced in 1901 to take effect in the fall of 1903. The decrease in numbers in 1904 was but the natural reaction.

the two lower classes, where the students are handled more in bulk, as it were, and where the cost of their instruction is much less than in the highly specialized professional courses of the two later years. That such was actually the case the following table shows:—

Year ending Sept. 30,	1900	1901	1902	1903	1904	1905
Percentage of the student body above the second year	47.2%	45.2%	42.8%	41.5%	47.3%	51.2%
Number of instructors per 1,000 students	115	109	105	103	122	120
Salaries for instruction per student	\$169	\$164	\$162	\$152	\$171	

From 1900 to 1903 the percentage of the student body above the second year fell 12.1 per cent. of the 1900 value. Simultaneously the number of instructors per 1,000 students fell 10.4 per cent., and the salaries for instruction per student 10.1 per cent. In 1904 all these items rose to or above the 1900 value. With 51 per cent. of the student body in the classes above the second year, there is little reason to expect a reduction in this largest item of current expense for the year just closing.* Without impairing the quality of instruction by reducing the teaching staff or by diluting it with cheaper men, further growth promises no saving in this largest item.

As to the other items of current expense, all show an upward tendency since some time between 1886 and 1890. The item of salaries for administration and labor—the expenditures for labor and for administration are practically equal—has increased steadily and rapidly since 1897. This is the place above all others where expansion might promote economy without detriment to the student. Yet in seven years, embracing a period of exceptionally rapid growth, the cost per student of administration and labor has increased 59 per cent.†

* The annual reports of the Treasurer are made for the year ending September 30, and are published as a part of the President's report in the January following.

† It is not to be expected that increase in this item will continue at the same rapid rate. The changes in the administrative organization in 1902 and 1903, with the creation of the offices of

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We have, then, two periods in the Institute's growth. In the first, which ended about 1890, the number of her students was less than the capacity of the educational plant, of which the instructing staff is so great a part, and growth meant large economies. In the second, the present period, with this plant running to its full capacity, each increment of growth requires at least a proportionate increase of buildings, equipment, and instructors. For fourteen years the consistent testimony of the Institute's expense account has been that there is no economy in greater numbers.

LEONARD P. WOOD, '01.

Dean, Registrar, Recorder, and Medical Adviser, caused an increase in the total amount of salaries for administration between 1901 and 1903 of nearly 50 per cent. Future increase in salaries for administration should for some years be relatively slow.

The recent increase in the total cost of labor, nearly 30 per cent. from 1902 to 1903, is due to two causes, enlargement of the mechanical staff to do such work as electric wiring, piping, etc., which was formerly done by outside labor and charged to the general expense account, and in 1902 enlargement of the engine-room force to serve the power plant of the new Lowell Building. This power plant could be made to serve an additional or a larger building with relatively little additional labor cost.

These considerations do not apply, however, to the large increase prior to 1902, nor do they warrant the expectation that the expense *per student* for salaries for administration and labor will undergo any marked reduction.

THE PROPOSED AGREEMENT WITH HARVARD
UNIVERSITY

RECENTLY PUBLISHED HARVARD OPINIONS

[From the Boston *Herald*, Sept. 14, 1905]

NEW HARVARD-TECH PLAN

PROFESSOR PICKERING SUGGESTS A FREE INTERCHANGE OF FACILITIES
BETWEEN SCIENTIFIC SCHOOLS*To the Editor of the Herald:*

The recent decision of the Supreme Court, that the Institute of Technology cannot occupy the entire lot originally granted it, seems to render the proposed merger with Harvard University impracticable. It is, therefore, a proper time to consider all plans which will secure for the millions of the McKay Fund its legitimate object, the greatest school of applied science in the world. This would be accomplished by the plan outlined below. It would secure the best features of the merger, could be undertaken at once without serious cost, and could be extended at will in the future. The insistent demand that both institutions should remain independent would be satisfied. It is only necessary that each should offer its advanced technical courses to the students of the other, without extra charge to them, and that such courses should count toward a degree at the institution at which the students matriculate, the cost to be paid by that institution out of their tuition fees.

Thus, if ten Harvard students wished to take a course in the Strength of Materials at the Institute, for which they would ordinarily pay \$50 each, they could do so without extra charge; and Harvard would pay the Institute \$500 for the privilege. The immediate result would be that each institution could offer its students the best facilities of both, and that there would be no needless duplication or wasted money. All the elementary work could be duplicated to advantage and without sensible loss. In some of the advanced work, as in metallurgy, students at the Institute are now occasionally obliged to be present continuously for nearly twenty-four hours, and generally at least half a working day at a time should be spent in such work. The distance between the two institutions, which can be traversed in twenty minutes, would here be unimportant.

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A joint committee of the two faculties should regulate all interchange of work, including the establishment of new courses, when needed. This would permit the greater portion of the McKay Fund to be used as the donor desired, for facilities in the Lawrence Scientific School, which cannot be obtained elsewhere. Post-graduate courses should be established, in which the students should receive salaries by means of fellowships; and thousands of dollars should be expended in machinery, apparatus, and similar plant, indispensable for work of the highest grade, but which cannot be afforded at other schools. High salaries for the professors, as provided by Mr. McKay, would secure the best men for these important positions.

Excellent technical schools with large endowments now exist at Hoboken, Bethlehem, Cleveland, Chicago, Pittsburg, and elsewhere. Many teachers and students would prefer to reside in Boston, not only on account of the libraries and other collections, but they would prefer to bring their families here for the social and educational advantages of an older city.

As an officer of one institution for ten years and of the other for thirty years, I have been fortunate in having had opportunities to judge of the aims and interests of both, and earnestly desire that both should be benefited by the greatest gift to higher technical education which has yet been made.

EDWARD C. PICKERING.

[From the *Harvard Graduates' Magazine*, September, 1905]

FROM A GRADUATE'S WINDOW

In the election of Overseers on Commencement two candidates received unexpectedly small votes. The Boston *Advertiser* stated editorially that this was due to the fact that these candidates were members of the Corporation of the Institute of Technology. They are well known, able, and popular Harvard men, who under ordinary circumstances might hope to be elected. There was certainly no concerted movement against them. The great majority of alumni simply said to themselves: "These candidates have for years been identified with the Tech. They have served it very loyally. One, indeed, is its Treasurer. They have recently voted to secure for the Tech the millions which Gordon McKay bequeathed to Harvard. If the merger is to be debated in the Board of Overseers next year, these men are already committed. Until that question is settled, we had better not elect them, but take candidates who can still weigh argu-

ments with an open mind, and who, above all, have not a stronger interest in another institution than in Harvard." . . .

Whichever way the merger is settled, every Harvard man will require that Harvard's representatives shall be single-minded in their devotion to the university, free alike from the suspicion of personal ambition and from that commercial narrowness which assumes, because it successfully promotes business mergers, that it is competent to run institutions of learning by adopting the same methods.

But the question which many persons, be they graduates of Harvard or of Tech, are putting is this: Is it expedient for the same person to be a trustee of two institutions which are in any sense competitors? Has not the multiplying of directorships been carried to absurd limits? . . .

Our Harvard Fellows are very busy men. To be Fellows at all, they must be able men. They serve the college out of devotion to it. Is it advisable to increase the labors of three of the Fellows by making them members of the Executive Committee of the proposed Peculiar Institution which is to be neither Harvard nor Tech, but a cross between them? Even if they had energy to spare for such an additional burden, would not their zeal for Harvard somewhat impair their usefulness toward the Peculiar Institution, or *vice versa*? We have had experience in a similar case of divided allegiance. Two more loyal Harvard men than the late Martin Brimmer and Edward W. Hooper have seldom served the college; but it happened that, when they were the Committee of the Corporation on the Building and Programme of the Fogg Art Museum, they were also trustees of the Boston Museum of Fine Arts. What was the result? It was this. They planned the Fogg Museum, not with a single view to the needs of Harvard and to the highest service which such a building might render here, but with a view to the effect it would have on the Boston Museum of Fine Arts. They wished to do nothing that might interfere with the development of that or curtail its gifts of original works of art. . . .

The Fogg Museum is a monument to a pedagogic fallacy and to a divided allegiance. . . .

If Harvard Fellows of the calibre of Mr. Brimmer and Mr. Hooper were so much preoccupied by the claims of another institution as to plan deliberately to restrict to the utmost the facilities at Harvard in one of the most important elements of culture, can we hope that other Fellows may not be similarly influenced, to the injury of Harvard, if they have also to direct the fortunes of the hybrid institution? Moreover, the members of the Harvard Corporation are already so very busy that it seems unwise to burden

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three of them with the further responsibility of managing another institution which may number at the start more students than the college proper has to-day. In the long run the "interest of the community" and, much more, the cause of education in America will not be promoted by any plan which impairs the efficiency of Harvard University, which depends in no small measure on the single-minded and unfatigued service which the members of the Corporation can give her. A divided allegiance is always a source of weakness, no matter how upright and intelligent the men may be who work under it. To shield our Fellows from this possible danger ought to be kept constantly in view, not only in planning an *entente cordiale* with Technology, but in all future combinations that may be proposed.

[From the *Harvard Graduates' Magazine*, June, 1905.]

GORDON McKAY.

BY N. S. SHALER.

... About 1880 Mr. McKay came definitely to the conclusion that he would apply his fortune to the education of men who should take a high place in applied science. He then proceeded to determine how he would carry out this plan. At first a separate school having his name attracted him. He abandoned this because with his engineer's sense—a very sound sense—he saw the difficulty of securing the foundations of his establishment in men devoted to his purposes. He then considered the plan of endowing some existing technical school. He was strongly urged by a friend with whom he had been in long and near relations to give his money to the Massachusetts Institute of Technology. This he carefully considered, and determined not to do, on the ground that the training in schools of that kind lacked the quality of general culture which he wished those educated under his endowment to have. During the years in which his trust was alterable at his pleasure, as it was until 1891, he on earnest solicitation twice reviewed this determination, but without altering his plan. . . .

At this stage of his consideration Mr. McKay began a careful inquiry concerning the fiduciary history of Harvard College. He was by nature an investigator, and his business success had been won by a careful exploration of the fields in which he entered. His method of examining this situation was characteristic of him. At his request and with the aid of the late E. W. Hooper, then Treasurer of the University, I prepared for him an extended account of the relation of the President and Fellows to the trusts confided

to them in the two hundred and fifty years of their service. The matter interested him much. He found it, as thereafter he often said, a wonderful record of faith-keeping. He was particularly interested by the history of the Dudleian Lectures. The preposterous requirements of that bequest have been so far as practicable adhered to unto this day. He blamed the Corporation for having taken such a trust, but, having taken it, he thought they did well to keep strict faith by it. The pledge to hold the college free from pecuniary loss, signed at the time of the Boston fire in 1873, was to him evidence in another way that his money would be safe. I well remember his saying, at the end of this investigation, that he felt he could trust to such faith for a thousand years or so to come. . . .

[From the *Harvard Graduates' Magazine*, September, 1905.]

LAWRENCE SCIENTIFIC SCHOOL ASSOCIATION

The annual dinner, attended by fifty-three persons, was held at the Hotel Vendome on June 28. Professor W. H. Niles presided. The "Merger" was the topic of the evening.

Professor N. S. Shaler, '62, dean of the school, was the first speaker. He said in part:—

. . . "Without now entering into the merits of the merger, let me say that the Massachusetts Institute of Technology and the Lawrence Scientific School, working separately and yet together, afford to this community an admirable range and scope of technical education. With a well-ordered adjustment of purpose they may give us the strength of two good helpers,—a strength that is greater than one can ever afford. Here are two stout, trained, and seasoned wheel-horses pulling this eternal load of education at a good pace. Shall we swap them for a merger mule? 'A critter with no pride of ancestry or hope of posterity?' The illustration is homely, but I think it apt. If you please, you may expand it into an allegory. I attempted to do so, but I will not now discuss the merger question.

"But I have not answered your insistent question, 'Is the merger to be accomplished?' My answer is, I do not know. But this I know full well, the matter is to be debated and determined by honorable men,—men who, however they may hunger for what they desire, are pretty sure in the end to do right. I trust much to the fact that the gift of Gordon McKay is now in the hands of three just and able men, who will see to it that his purposes are carried out, and that, when in time it passes to the Corpora-

tion of Harvard College, it goes into the hands of other just men who, in their succession from generation to generation for two hundred and sixty-nine years, have kept faith with the dead and the living; and back of them is a community that knows well what faith is, and keeps to it; and above all are our just courts. So, while I am prepared to contend by day for my convictions, I propose to sleep sound by night, knowing that, if even-measured justice is not had here, the article has slipped from this planet."

[From the *Harvard Graduates' Magazine*, September, 1905.]

THE MERGER: PRO AND CON

The proposal of the Corporation of the Institute of Technology for a merger with Harvard is not yet officially before the Governing Boards of the University, nor will it come before them unless the courts hand down a favorable decision in the suit now pending to allow the Institute to sell its property on Boylston Street, Boston. As a matter of record, however, and in response to inquiries, an outline of the present situation is given below. A compilation has been made of the heads of the arguments pro and con, as they have recently passed current. This compilation is, of course, neither exhaustive nor official; but the editor, in order to make it more representative, requested leading champions of each side to suggest reasons, and these have been incorporated in the compilation. The replies of two prominent graduates, one for and one against, are printed in full. . . . One point will strike whoever attempts, by interview, by conversation, and by a study of the statements already made, to reach a comprehensive understanding of the question; and that is the wide-spread suspicion that there is something behind which has not been revealed,—that the official explanations do not give the real reasons. This suspicion, or doubt, prevails alike among the alumni of both institutions. The anti-merger Tech men cannot be dissuaded from thinking that the merger will result in the absorption of the Institute by Harvard, the desirability of which President Eliot has urged for thirty-six years. Harvard men, on the other hand, suspect that the underlying reason of the pro-merger Technology party is that they realize that, unless the Institute can speedily secure a much larger revenue, it cannot keep up with the increasing demands of a first-class technological school. This revenue they see no possibility of getting in any other way except by bargaining for the lion's share of the McKay income.

It is to be hoped that, if the project is brought for decision before the Harvard constituency, these doubts and uncertainties will be cleared up, and that both the promoters and opponents of the merger will agree as to its main purpose and its probable effect, if carried out, on the University and the Institute.

In the following rough compilation of reasons for and against, no attempt is made to classify the reasons or to offset one with another. In some cases they overlap: in others the advocates of one side have not as yet replied to their opponents' argument. It should be remembered that the reasons here given, whether pro or con, are from the Harvard standpoint. An examination of the arguments of the Technology advocates of the merger shows that they have emphasized chiefly the direct benefit which the Institute would receive from it: (1) by removing the competition of Harvard, which already excites alarm and may become paramount; and (2) by relieving financial pressure. The Harvard pro-merger advocates have urged, in the main, not that the alliance will directly or greatly benefit Harvard, but that it will advance the general cause of scientific education. The reasons presented by the opponents, whether Harvard or Technology men, cannot be reduced to two or three heads.—*Ed.*

Reasons for the Merger

1. The consolidation of the two strongest educational institutions in Massachusetts will permit the building up of a school of science which will be national in its scope and more than twice as powerful and efficient as the Institute and the Harvard Scientific School could hope to be as rivals.
2. It will remove injurious competition.
3. It will prevent costly duplication of plant.
4. The interest of the community, on which both institutions chiefly depend for support and students, will be promoted.
5. The Faculties of both institutions will profit by being brought into close contact, from which they can learn each other's aims and methods.
6. Harvard undergraduates will be benefited by having the example of sixteen hundred hard-working Technology students constantly before them.
7. The merger, by consigning industrial and technical teaching to the new institution, will relieve Harvard from the burden of maintaining a department for mere "bread-and-butter" instruction, and enable the college to devote its energy to the promotion of "humane" studies.
8. The two-fifths of the income of the McKay Fund will enable Harvard, with its present resources, to develop its work in pure science to the highest efficiency.
9. There is nothing in the proposed alliance contrary in letter or spirit to the terms of Gordon McKay's bequest; nor does it appear that he recorded his opposition to the project, although during the last years of his life, when it was constantly under discussion, he had ample opportunity to do so, if he chose.

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10. It will be impossible to find first-rate teachers for both institutions.
11. Harvard, by renouncing the opportunity to create a great school of science which would add to her influence, would set a noble example of disinterestedness.
12. The rapid growth of high-grade institutions outside of New England will soon create a serious competition which Harvard and the Institute can best meet by uniting.
13. Too much stress should not be laid on the existing hostility of the Technology faculty and alumni: a few years of friendly intercourse and mutual helpfulness will heal all differences.
14. If Harvard rejects this union, by which it will practically control the Institute, what is to prevent the latter from developing its academic department and drawing away possible students from the college?
15. The Corporation of Harvard College have already a great burden to carry: the merger will relieve them from the cares of a department which promises to grow rapidly, and will present many intricate problems.

Reasons against the Merger

1. It is immoral, for it violates the terms of the will and known wishes of Mr. McKay, who had, after long deliberation, chosen Harvard as his beneficiary, and declined urgent requests to help Technology.
2. Even if the courts should legalize the proceeding, it would forever cast doubt on the good faith of the Harvard Corporation, and discourage possible benefactors of the University.
3. Healthy competition is indispensable to progress in education.
4. The amount of duplication of plant would be much smaller than is claimed.
5. If the avoidance of competition and duplication be the real motive for the merger, why have the architectural departments, in which competition and duplication are greatest, been excluded? Will Robinson Hall be merged later?
6. The community would gain more from two vigorous institutions, each with well-defined individuality, than from one.
7. Harvard University ought to have—and the McKay bequest will enable it to have—a Scientific School of equal excellence with the Law and Medical Schools. It is suicidal to deprive it of a great branch of instruction, through which it will come into touch with many of the vital interests of the country.
8. The Scientific School has made the greatest advance in recent years, and attained in some departments a standard already higher than in the Institute, and with the means the McKay bequest provides progress will be rapid.
9. The general cause of education will be best promoted by the development of a great technological school according to Harvard ideals rather than according to the commercial standards of the Institute. If Harvard had delegated the teaching of law to another institution, legal education would not be what it is, and Harvard would now lack an important part of her power and prestige.
10. The demand for teachers will soon bring a supply, especially since Mr. McKay stipulated that high salaries should be paid.
11. Nine-tenths of the Faculty and nearly three-fourths of the alumni of the Institute reject the merger: it is not becoming in Harvard to accomplish by force a union the success of which must depend largely on the good will of the parties concerned.
12. The best asset of Harvard or the Institute is the loyalty of its graduates and teachers; yet it is proposed to dispose of the Faculties of the Scientific School and of Technology, against

their will and judgment, as ruthlessly as if they were professional baseball nines or manufacturing plants. The spectacle of the corporation of a great institution paying no attention to the traditions, associations, and ideals of its alumni and teachers must increase the disregard of the public for institutions of learning.

13. By properly organizing the Harvard Scientific School, the academic department need not be encroached upon.

14. A simple agreement, not requiring a revolutionizing policy at the Institute and the destruction of the Lawrence Scientific School, could be made to prevent really harmful competition.

15. It is a poor requital to the ability and devotion of the men who in ten years have raised the Scientific School to a high level, to abolish the school and force them either to resign or to serve under an unsympathetic régime.

SPECIMEN REPLIES FROM TWO PROMINENT OFFICERS OF HARVARD

For

"Leaving the interpretation of the McKay will to the Supreme Court, and assuming that the bequest may be used in the manner proposed for the merger, I am in favor of the plan because I believe there would be a great advantage in the creation of one strong school of science in the place of two neighboring institutions, with their inevitable duplication of expensive plant, and with the ever-increasing difficulty of securing a supply of competent teachers.

"I think the college would gain by being relieved from the encroaching demands of scientific instruction, and the Institute would gain from the larger opportunities afforded to its students in the field of humane studies.

"The objections to the merger are mainly, it has seemed to me, sentimental, personal, and determined rather by immediate interests than by consideration of the long secular interests of coming generations. In a long view I cannot doubt that the interests of education will be promoted by the merger."

Against

"My first reason against the merger in its proposed form is the gross breach of faith, to use a mild term, involved in carrying it out. From a talk with the trustees of Mr. McKay's will and from reading a copy of the will itself it is evident that Mr. McKay selected Harvard for good and valid reasons to be the recipient of his money and the dispenser of the same in the channels that he proposed. This, too, after having had the needs of the Institute of Technology and their methods and system of instruction fully explained to him. Giving the Institute of Technology this money

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or any portion of it is a breach of faith, not only injurious in itself as an example of what a college whose motto is *Veritas* ought not to do, but also most injurious in preventing donors in the future leaving their money to Harvard College where their wishes will be so little respected.

"These two reasons, in my opinion, should be sufficient to condemn the thing utterly and entirely.

"There are many other reasons which also enter into this question. One of the most important is the form in which the college proposes to capture the Institute of Technology. If we are to have a merger, let us have it in an open-handed, manly fashion, and not in any indirect or underhand way by getting them to unite with us temporarily in hopes that lack of means will compel them ultimately to yield themselves wholly to the University. If what I hear is correct, this phase of the question is eliminated by the fact that the President of the University openly avowed, at a meeting of the Faculty, that the intention of Harvard University was to absorb and swallow the Institute of Technology.

"As far as Harvard University is concerned, the alumni of the college should be consulted where such a large portion of the funds of the University are to be given away as is the intention in the present case. The recent vote for Overseers would seem to indicate that the vast majority of the alumni of the University were distinctly opposed to a merger in any such form as at present indicated."

LAMPY'S VIEWS ON THE MERGER

Mistress Harvard Loquitur

Sir Tech, you woo with clumsy tongue,
You're really acting very young;
My money's praises you have sung,
And never yet have breathed my own.
You mention not my pretty face,
My sweet disdain or heedless grace.
You should have vowed, to win your place,
You loved me for myself alone.

THE DEEPER SIGNIFICANCE OF SCIENTIFIC EDUCATION

The independent scientific schools which have sprung up and flourished during the last half-century are to-day facing a serious crisis. There is at this time, not only in Boston, but in other places in the United States, a more or less determined effort to effect organic connection between technical schools and neighboring classical colleges. Some, even in the strongholds of scientific education, are ready to give aid to this movement. They are impatient of the sure, if slow, progress which has been made. They have not looked deeply enough into the heart of their own system to see its promise for the future.

The danger to the real mission of the higher scientific school is a very grave one. Every institution of learning which really trains men for power has some predominant scheme of culture, and the keynote of the classical training is the study of the art of living as seen through the medium of the human mind. Its aim is to teach by contact with the great leaders of the past and present. The classics, literature, history, philosophy, all regarded from the subjective view-point, develop thought and feeling, stimulate and liberalize. Surrounding such a curriculum are the graduate schools which give, to those who have acquired general culture in the college, definite training in the details of their professions. Studies for the doctorate carry the teacher and the investigator further along the lines of history or language or literature. Science has crept into the undergraduate curriculum as a relief to the serious work of culture and a necessary concession to the times. It has been added to the graduate departments in schools of medicine and engineering of a purely technical character. Neither of these positions in the least satisfies the claims of those who believe in scientific education. Science to them is not merely a method of doing certain kinds of work, not merely a subordinate part of a liberal education. It is the foundation and the core of one system

of liberal education just as academic culture is the foundation and core of another system. Let us briefly consider the grounds for such a claim.

It will scarcely be gainsaid that the object of education is to train men and women to live happily and usefully. Happiness and usefulness are not really two ends but one, since they must be attained by the same means. Life, in the ringing phrase of Herbert Spencer, is "the continuous adjustment of internal relations to external relations." Adaptation to the environment is the secret of existence. In harmony with surrounding conditions, if we mean by that term not merely physical surroundings, but the mental and moral and spiritual environment, is found alike individual satisfaction and the opportunity for usefulness. How to produce such an adaptation is the problem of education.

If we accept such a definition, there are evidently at once two sorts of knowledge which the student must acquire. "Know thyself," said the ancient philosopher. "Look out, not in; up, not down; forward, not back; and lend a hand," responds a modern. Diverse as the formulæ may seem, we must unite them to form the antiphon of education.

Perhaps, after all, the two problems are not so distinct as they appear. If, as monistic philosophy teaches, the human organism is subject to the same laws as the rest of the material universe of which it forms simply the most complex part, then the outward view is, perhaps, the best background for self-knowledge. It is significant that the infant begins to recognize the environment some months before self-consciousness distinctly dawns. It refers to itself as to an external object, and only later conceives the meaning of the first personal pronoun.

The fundamental problem is that the child, or the man, to be educated, should learn about the universe in which he finds himself, in order that he may intelligently meet its demands and co-operate with its forces. Conceive the student as standing open-eyed on the shore of a strange country where all natural laws may be unique and strange. Does fire burn here? Do objects fall downward?

Does night follow day? Such would be the questions of the intelligent but untrained mind, and surely the answer to such questions should be the ultimate aim of education. Yet we see many and many a graduate of a university who has never mastered—in the depths of his soul—even the fact, that there are such laws, immutable, inevitable, universal laws, which control the swing of constellations and the movement of motes in the sunbeam and the succession of thoughts in the mind of a poet. Of all the lessons of education this is the most basic. No man achieves success who holds it the gift of a freakish divinity; no man conquers sorrow who deems it a visitation of malign fate. He only who seeks to “spread the belief in right reason and in a firm intelligible law of things” has the power to achieve. He only who knows that there hath “no temptation taken you but such as is common to man” has the power to suffer.

There are those who say, “It does not matter what you believe, if you are sincere.” If we live in a universe of law, where existence depends on adaptation, that is a shallow saying. What a man is to become depends on what he believes. The more earnestly a wrong belief is held, the more loyally its tenets are followed, the more tragic its results. The officers of the Inquisition were terribly sincere. The anarchist assassin followed his lights with almost heroic devotion. They did harm because their beliefs were wrong, because they had imperfectly grasped the true laws of the universe.

There is a second great truth to be learned. As the scholar studies the machine-like scheme of cause and effect, a light gradually illumines it, as the sunrise first flushes, and then floods, the sea with radiance. Isaac Newton more clearly than any other man grasped the conception of a universe of law, and made tangible what the religious mind perceived by faith to be God’s justice,—the Roshana Buddha of law. Two centuries later, Charles Darwin made it plain that behind the apparent iron evenness of law lay another principle, the principle of progress. It is a progress through struggle. The day and the individual may fail. The future and the race are sure. These

I hold to be the two facts about the universe which are of the deepest and most tremendous import,—the immutability of Law and the principle of Progress. Let us apply them in somewhat more detail to our educational problem of the adaptation of the individual to his environment.

Consider first the duty of self-knowledge. In order to be either happy or efficient, a man must know something about the powers at his disposal. He must recognize himself primarily as a physical being, a complex life machine, subject to the laws of other life machines, which in a last analysis prove to be the laws of chemistry and physics. His mechanism must be kept in normal operation. It must be stoked with food. It must be protected from the rust of idleness and the wear and tear of careless use. Food, work, and sleep,—these are the three fundamental conditions without which the machine can never produce the best for which it is adapted. Less obviously, but no less truly, the intellectual faculties are subject to fixed laws. Every idea that flits through the mind has its cause in some immediate stimulus from without, in the inherent or acquired structures of the brain or in the interaction of the outer force upon the inner sensorium. A step further carries us to the life of the natural emotions; and we come finally to the realm of spiritual existence. Tradition has barred science from this field. Science has too often in retaliation denied its very existence. Yet the investigations of the last quarter-century, by James and others of his open temper, have shown the effect of spiritual forces upon the human organism as far too real to be ignored by the biologist. The problem is of vast complexity. Yet we must claim here, too, that law is paramount. Emotional and spiritual experiences like those of mind and muscle are the product of objective forces acting by fixed laws on the reactive structures of the individual. As we study those forces and comprehend those laws, we shall learn to control them for good.

The human organism has the marvellous property of growth which characterizes life machines. The muscle which can lift a certain weight to-day may lift a little more to-morrow. Gradually by use it strengthens and develops. So the mind gains power to

solve intricate problems, and the soul grows in capacity of spiritual experience. The principle of progress through struggle, here as everywhere, is paramount; and this thought is full of hope and inspiration. It is true that in each individual case the power of development is limited by fundamental constitutional characteristics. Mind and spirit have their own range, and can no more be stretched beyond a certain point than a congenitally weak arm can be made the arm of an athlete. In failure this truth should teach patience with one's self and infinite charity towards others. Yet in each instance none can determine just where the ultimate limitations may be placed. The network of the brain cells is vastly more complex than any other structure, more pregnant with the possibilities of growth. New powers, new combinations of old powers, emerge day by day to meet and surmount new difficulties. Just as grace and strength grow in the directed training of the athlete, peace and power come through the earnest struggle of the mind and heart. The development of the muscles is not actively progressing in the race to-day. These structures remain much as they were fixed long ago. The organs of the mind, however, are still in the stage of active evolution. Here the forces of selection are in vigorous action. We can set no limit to the possible fruits of their development.

We are, then, organisms subject to natural laws and limitations. We are living organisms, however, and the word "life" means change, growth, potency of development. Only in obedience to law may life and growth go on. Adaptation to the environment, in the harsh term of science,—conformity to law,—is the great secret of life, the great aim and end of education: first, and least, adaptation to the simple physical laws which affect the body and senses; then adaptation to the intellectual and moral laws which govern the world of the mind; finally, adaptation to the spiritual truths which underlie and permeate all the material universe "as the waters cover the sea."

President Hyde in "From Epicurus to Christ" has traced a suggestive outline which he calls a study in the principles of personality. He might well have called it a study in the principles of adaptation.

Epicurus taught an active adaptation, by the search for all good things which the world offers. Epictetus taught a passive adaptation, by the avoidance of those things which experience proves hurtful and disturbing. Aristotle taught a scientific adaptation, by the study of the proportions and relationships of existing facts. Plato taught adaptation to an intellectual abstraction of the essential principles behind phenomena,—a step forward on the way of truth, since it lifted the problem from the sphere of conduct to that of consciousness. In the Gospels, adaptation reached its climax in the perfect and supreme harmony of the Law of Love.

The forces in each one of us are as truly motive powers as are any of the outer forces of the universe. All are but manifestations, small or great, of the same eternal energy. Your force or mine may delay, though it cannot set back the tide of universal progress. Soon, or late, the man or the nation nearest to the fundamental, universal truths will surely triumph. No man does a great work but the man who has allied himself with some great phase of truth and has made himself its channel and its mouthpiece. Such a man has adapted himself in a high sense to his environment, the universe. By that adjustment the strength of the universe is his. In harmony with universal law he in turn acquires creative force and now moulds the environment, in adaptation to the principles which he has mastered.

Simply to be in harmony with what exists may seem an ignoble and a barren aim. Indeed, it must be so to those who do not grasp the note of progress in the world. The Ages of Faith have not passed. These too are ages of faith to those who believe that God causes the wind to blow and the leaves to fall and the ripples to play across a mountain lake. "Cleave the wood, and ye shall find Me. Lift the stone, and I am there." Behind all phenomena deeply studied is not only truth, which may be passive, but love, which is truth in action. All through the universe is a mighty tendency which ever and always moves onward,—“the power, not ourselves, that makes for righteousness.” To know that tendency is to know God. To work with that power is to serve God.

There is, I believe, not one of the virtues which cannot be justified as an adaptation to natural law, proved to be such by the results which actually follow its practice. The care of the body, the virtues of purity and moderation, are easily recognizable under this guise. Truth and honesty, no less clearly, are most important because they are vindicated by their coincidence with existing facts. Gentleness, courtesy, and patience rise to a higher plane. They imply adaptation not merely to physical phenomena, but to the personalities of other men. Still more remote from the obvious external facts of existence, are the moral virtues of courage, perseverance, modesty, and breadth. These, too, are of value just because they harmonize with a moral order in the universe. Finally, the spiritual motives, faith and love (toward God and man), are no less clearly justified by the fruits of power and peace which follow in their train. "Love is the fulfilling of the law."

If the view of life which has been sketched in these pages be a true one, there are three chief principles which it is the task of education to inculcate: first, the universality of law; second, the principle of progressive evolution through struggle, inherent in every phase of the universe; third, the duty of adaptation, conceived not as passive surrender, but as the direction of one's force in harmony with universal law and along the lines of general evolution.

The true mission of scientific education is to give such a training as this, by bringing the student into direct contact with the very laws themselves. It is founded firmly on the experimental method and the process of inductive reasoning. It begins with mathematics. All natural laws are capable of expression in mathematical terms, and the ultimate task of science is, in essence, little more than the accumulation of quantitative data from which general formulæ may be deduced. It passes through physics and chemistry to their higher branches, astronomy and geology. It proceeds to biology, and, still with the same experimental and inductive method, widens to take in psychology and sociology. Every possible phase of natural law in the material or the spiritual world comes rightly within its scope. In whatever field its student moves, his footing is sure, if every step is tested and proved by comparison with fact. His ideal

is always high, his vision broad, if his one aim is the universal truth which lies behind inharmonious phenomena.

If it be true that such is the aim of scientific education, we must own frankly that our technological schools have too often fallen far short of its attainment. The dazzling immediate possibilities of applied science offer a continual pressure for the teaching of details, the preparing of men for the routine of an occupation instead of that training in fundamental principles which alone can fit men for a profession,—by fitting them to live; yet the successes already attained have given scientific men ground for confidence that their system is full of promise. Its possibilities have even to-day scarcely begun to germinate, but germs are precious things. I remember hearing a wise priest compare “natural” virtue to a crystal and grace to a seed. The most perfect of dead things is inferior to the crudest of living potencies, as the moment falls short of eternity.

Scientific culture is a new educational ideal, which demands the right to live its life and work out its own salvation. It has no necessary rivalry with the academic system. The two roads to knowledge are equally royal. To some minds, power comes best through the old academic scheme of things. For other minds the direct appeal to nature is the surest way to self-knowledge. For them the power to live can best be gained by the study of law and progress and adaptation as they manifest themselves in the universe of nature. The end is the same. The paths are different. From the study of the mind of man has developed the university of the past. On the study of the laws of nature will depend the scientific university of the future.

C.-E. A. WINSLOW, '98.

EDITORIALS

The decree of the Supreme Judicial Court of Massachusetts forbidding the Institute either to sell its Boylston Street land or to occupy with buildings more than one-third of that area comes as a great surprise, it being believed that, even should the court find it impossible to interpret favorably the ambiguous language of the original act of legislature, they would deem this to be superlatively a case where private interests should give way to the needs of a great and beneficent public institution. The decision being, presumably, final, the Institute must accept the unexpected, and must adjust its policy to the limitations imposed by the unfortunately narrow phraseology of its original charter. It is imperative, however, that it should determine that policy quickly, and should lay out a definite and stable course of action. For nothing external to her can so injure the Institute as she can hurt herself by pursuing much longer an indefinite and vacillating policy.

The REVIEW is greatly interested to learn that a National Conference of the Trustees of American Universities is to be held this month at the University of Illinois in connection with the inauguration of its new president, and that this conference will be devoted to a discussion of the best form of administration of higher educational institutions and of the proper share of trustees, faculty, and alumni in their government. Such a discussion is of especial interest at this time to Institute men because of the unfortunate divergence in opinion of the Corporation and Faculty as to the future educational policy of the Institute, and because of the absence of any intermediate body or other means of conference by which an intimate exchange of opinions might take place, and the differences in point of view of the two bodies might be reconciled or compromised.

Whatever be desirable from an ideal standpoint, the practical conditions surrounding American education, especially the legal requirements and the constant need of renewed financial support, will undoubtedly make necessary the existence of a board of trustees in our educational institutions. The proper relations of such a board to the faculty and alumni is a large question, and one which must receive a somewhat different answer in different institutions. The REVIEW believes, however, that the following general principles are vital to the soundness of our educational system. The board of trustees and the faculty must be co-ordinate bodies, the latter being in no sense subordinate to the former. There must be as sharp a division of functions as is practicable, the trustees dealing exclusively and finally with legal and financial questions, and with the appointments of president and faculty, and the faculty having exclusive jurisdiction in purely educational questions, including not merely the details of instruction, administration, and student government, but all matters relating to curriculum, courses of study offered, and degree requirements. General questions as to educational aims, and all the numerous questions involving both financial and educational considerations, should be discussed by both bodies, and should be acted upon only after substantial agreement has been reached. And to this end there must be established conditions of harmonious co-operation and frequent opportunities for intimate contact and exchange of views. This would seem to be best obtained by the formation of an advisory council,—consisting of five or six members from each body, with the president as chairman,—which, after thorough discussion, should make recommendations both to the trustees and to the faculty. Finally, the alumni not only should be urged to participate in the conduct of the social and athletic life of the students, and to recommend improvements in the courses of study, but they should also be given some direct and substantial share in the government of the institution.

Although an amateur, the REVIEW is so far bound by the unwritten code of journalism as to be debarred from mentioning by

name that Boston newspaper which has made the judicious griever by its hysterical outpourings relative to the proposed alliance with Harvard University. So preposterous, however, have been the imaginings of its news columns that not even the running reader can have paid much heed or given much weight to those editorial utterances in which this journal has many times stated or implied that the Institute of Technology has graduated nothing but rod-men, draughtsmen, and similar underlings of the professional world. Such misstatements would not be worth the trouble of contradicting, did they not have rise in the statement made freely during the past year or two by some of the Institute's own guardians and sons, that Technology turns out subalterns rather than captains or generals in the industrial and scientific world.

Those having a wide acquaintance with Institute men and with their weight and influence, especially in the West, need no statistics to refute such statements. Nevertheless, the REVIEW has thought it worth while to marshal the data of the "Register of Graduates," not only to show that Technology alumni are not subalterns, but also to emphasize the fact that most of those Institute men still have their lives and their careers before them.

The list given in the last published Register—that for 1904-05—includes the classes from 1868 to 1904; but the REVIEW's inquiry has been limited to the classes from 1868 to 1899 (inclusive), it being obvious that the first five years after graduation are spent by most of the alumni of any college in determining their final line of progress. These thirty-two classes had 2,010 graduates living. Of those, however, forty-eight should be excluded from the reckoning, being either men of independent fortune who do not care for employment, women graduates who have married, or persons who have failed to keep the Institute informed of their address and occupation. This reduces the number to be considered to 1,962. Owing to the youth and early struggles of the Institute, however, the graduates are not evenly distributed among the thirty-two classes. On the contrary, half of those 1,962 graduates finished

their courses at the Institute within the six years between 1894 and 1899. Assuming the average age of the graduating class to be twenty-three (a somewhat high figure), multiplying this by the number in each class, ascertaining the total, and dividing it by 1,962, we find the average age, in 1904, of the graduates between 1868 and 1899 (inclusive) to have been only 35.6 years. The Technology graduate, therefore,—even by the severe standard of Dr. Osler,—is five years below the age limit of original achievement, and has still twenty-five years more in which to make his record in the world. Yet half these young men are already in positions of independence and authority, and a third of them have achieved the highest which, in their several professions and other occupations, can be reached. Far from being “rodmen and draughtsmen,” 60 per cent. of these Institute alumni (more than half of whom are graduates of less than ten years’ standing) are their own masters, and are the officers of battalions and regiments in the industrial world.

It would be both tedious and invidious to name the many distinguished engineers and officials who are possessors of the Institute degree; but the following tabular statement is as impersonal as it is illuminating:—

GRADUATES OF THE M. I. T. 1868 TO 1899 (INCLUSIVE).

Presidents of railroad, manufacturing, mining, or contracting corporations	63
Vice-presidents of the same	25
Treasurers of the same	48
Chief engineers of railroads and other large enterprises	31
Resident, division, or maintenance-of-way engineers	14
General managers	78
Managers or superintendents	119
Consulting or contracting engineers	80
City engineers	9
Engineers in independent practice	78
Consulting or manufacturing chemists	40
<i>Carried forward</i>	585

Graduates continued

<i>Brought forward</i>	585
Architects in independent practice	80
Full professors	38
Associate or assistant professors	44
Lawyers in independent practice	26
Physicians in independent practice	17
Other professional positions of authority	23
Heads of or partners in large mercantile enterprises	102
Selling or commission agents (independent)	14
Bankers or brokers	12
Heads of Federal or State Bureaus	13
Owners or chief editors of newspapers or other periodicals	8
Masters of public or private schools	6
Trustees of large estates	4
Officers in United States Army or Navy	8
	<hr/>
	980

The decline in the total number of students, and particularly in the first-year class, as noted under the General Institute News, is a fact of much significance and interest. While increased entrance requirements and a higher tuition fee would tend to reduce the number of admissions, the actual falling off appears to be mainly due to the non-attendance of candidates admitted. The first-year class, which is normally about thirty-five larger than the number of June admissions, is this year forty smaller. The reiterated and exaggerated newspaper statements made throughout the country have tended to create a wide-spread public belief that the Institute is seriously embarrassed by lack of funds, by lack of room, and by the competition of other schools. The scope and character of its work have been misrepresented as narrow and purely technical, and all sorts of possibilities as to future policy have been presented as under consideration by its authorities. All this has undoubtedly had an important effect upon the accession of new students.

GENERAL INSTITUTE NEWS

CORPORATION NOTES

After the meeting of October 11, the President, as authorized by the Corporation, issued the following statement:—

To Alumni and Former Students:—

At a meeting of the Corporation of the Institute, held on October 11, a report was received from the Executive Committee, advising the Corporation that, in the view of the Committee, the recent decision of the Supreme Court of Massachusetts relative to the land on Boylston Street made it impossible for the Institute to take further steps in the plan of co-operation with Harvard University, which has been under consideration the past year.

In view of the facts set forth the Corporation thereupon adopted a resolution instructing the Executive Committee to notify the authorities of Harvard University that the Institute found itself unable to proceed with the plan of co-operation, and to express at the same time the appreciation of the Corporation for the fairness and courtesy with which the authorities of Harvard had joined in this common effort to solve a difficult question.

The Corporation further authorized the President to communicate this result to the alumni, Faculty, and friends of the Institute, and to invite their hearty co-operation in the future upbuilding of the Institute.

This decision disposes not only of the matter of an alliance, but also, for some time to come at least, of the question of a site. It seems clear that the Institute's home must continue to be, for a number of years, its present one, with such added room and buildings as may be found necessary and practicable. With these questions settled, it is clear that the duty of each Institute man, of each friend of the Institute, is to go heartily and enthusiastically at the problems which lie immediately and clearly before us, with the ambition to make the Institute the most efficient means possible for ministering to the intellectual, moral, and social life of its students. The questions upon which we have honestly differed are now out of the way. Let us now pull together for the solution of our common problems. Some of these problems need to be attacked at once. Outside of the question of increased endowment, which is most pressing, additional land ought to be secured as

soon as possible; a site for the Walker Memorial Building must be provided and the building started as promptly as possible; and an additional building, such as a chemical laboratory, and the erection of one or two modest dormitories on our land in Brookline adjoining the athletic field would serve a great need of the student life. To the solution of these pressing and specific problems the Corporation asks your heartiest support and assistance.

(Signed)

HENRY S. PRITCHETT.

Boston, October 12, 1905.

FACULTY NOTES

Changes in the Faculty since last year are mainly due to promotions. New members, as already noted in the July REVIEW under Departmental News, are: Assistant Professors Samuel P. Mulliken, '87, Organic Chemistry; George B. Haven, '95, Mechanical Engineering; Walter S. Leland, '96, Naval Architecture; William J. Drisko, '95, Physics; Harrison W. Smith, '97, Electrical Engineering; Charles-Edward A. Winslow, '98, Biology; Carroll W. Doten, A.M., University of Vermont, Economics; D. W. Johnson, Ph.D., Geology.

Mr. W. E. Mott, '89, returns to the Institute from Cornell University as Assistant Professor of Civil Engineering.

Dean Burton sailed for Europe September 6, and will spend the winter in Paris. Professor Merrill, after service as Acting Secretary during Professor Tyler's absence, has now been elected Acting Dean during Professor Burton's stay abroad.

Professor Tyler spent March and April in Paris, May and June in Switzerland. During his stay in Paris he acquainted himself somewhat with present tendencies in French mathematical instruction, particularly in the preparatory work for the higher institutions. New programmes for this work have recently been adopted after a careful study of the matter by distinguished mathematicians. Under these programmes the final year in the preparatory school is devoted very largely to mathematics, and students entering the École Centrale, for example, have had nearly as much mathematics as is required in the Institute course. This result naturally depends upon a high grade of mathematical teaching in the preparatory schools, but the

teachers in these schools appear to have little free initiative, being closely bound by a centralized administration. This principle of centralization in education would make the study of French schools relatively simple but for the difficulty of gaining actual access to their work, at any rate in case of the higher technical schools.

In Switzerland, Professor Tyler visited the interesting minor technical schools at Geneva, carefully adapted to local needs, the University of Lausanne, exceptional in having a technical faculty, and the great Federal Polytechnic at Zürich. Higher education in Switzerland is represented by a number of small universities in the various cantons, and by the Polytechnic alone on a national basis. The University of Zürich occupies a fraction of the main building, because at the time the Polytechnic was founded the local authorities undertook to provide a building for both institutions. There is, however, no connection in the budgets of the two institutions. Even where there are common institutions, as museums, or common professors, each of the institutions pays separately that share which has been agreed upon in each special case. There is a constant tendency to farther separation of those museums and professorial chairs which were at first arranged in common for the sole reason of economy. Negotiations are pending for separating that part of the buildings which is at present common to both, and in a few years' time this will be entirely accomplished. In other words, the relation is not radically different from that which subsisted until very recently between the Institute and Boston University. Professor Tyler found the Zürich professors particularly interested in the sabbatical year institution, of which they supposed him a beneficiary; but he was forced to admit that only a few of the richer American universities have yet been able to adopt it.

Two of the most notable characteristics of the Polytechnic are the liberal provision it offers to young men of whatever nationality to obtain an admirable technological education at a nominal cost, and the direction of the institution by a small board (the *Schulrat*) chosen by the government for that purpose alone, and not combining the responsibility for other forms of higher education with this.

THE NEW YEAR

The registration of the present year shows a notable decrease of 130 from that of last year at the same date. While exact statements are not yet available, it appears that the greatest falling off—from 400 to 275—is in the first year, which has numbered during the past five years as follows: 374, 440, 479, 348, and 400. During these five years the number in the entering class has averaged about 35 more than the number of candidates admitted in June, but this year the first year class is about 40 less than the number admitted in June, or 75 smaller than would have been estimated at that time.

The principal causes affecting the number of students directly are recent advances of entrance requirements and of the tuition fee. It will be recalled that in 1903 both French and German were required for admission, and that the present year Physics has been added to the list. An effect of these advances has been to retard preparation and delay admission, while at the same time the proportion of candidates rejected has increased. Moreover, two examinations in algebra are now required instead of a single one as formerly; and, while no more ground is covered than before, the greater thoroughness of the examination tends to increase the proportion of failures. It should not be inferred, however, that the Faculty has established or expects to establish any exceptionally high standards of admission or to create any gap between a good high-school course and that of the Institute. The aim has been rather to secure somewhat greater breadth of previous study and the completion of elementary work in Modern Languages before entrance, and to sift out somewhat more completely applicants not really capable of the kind of work required of Institute students. While there has been an advance both in quality and quantity, the Institute still requires no more than other strong scientific schools and departments, and its requirements can still be met without difficulty by the better public high school. The addition of Physics the present year is not believed to have had a marked effect on the size of the entering class, because the examination was purposely

made simple, and the proportion of failures was no greater than was to be expected.

The advance of the tuition fee had a marked effect on the entering classes of 1902 and 1903, increasing the former at the expense of the latter. In general, the effect of such an advance is likely to be somewhat cumulative, because the choice of a higher institution is usually made several years in advance of actual admission, and some candidates have entered during the past three years rather than change a choice already made. It would seem fair to expect a somewhat greater tendency to anticipate the elementary work of the Institute course by attending other colleges and scientific schools at less expense, entering later with advanced standing. This tendency corresponds with a considerable increase in the number of students entering this year with advanced standing.

Among the institutions represented by graduates or students transferring to the Institute are: Acadia (Nova Scotia), the Agricultural and Mechanical College of Texas, Amherst, Armour Institute of Technology, Bates, Beloit, and Boston Colleges, Bradley Polytechnic Institute (Peoria), Brooklyn Polytechnic Institute, Brown University, Catholic University of Santiago, Centre College, Columbia and Cornell Universities, Dalhousie, Davidson, Dartmouth and Dickinson Colleges, Franklin and Marshall University, Hamilton College, Harvard University, Holy Cross College, Imperial University of Tokyo, Johns Hopkins University, Kansas State Agricultural College, Lafayette College, Maryland Agricultural College, McMaster University, Nevada and Ohio State Universities, Ohio Wesleyan University, Olivet College, Oregon Agricultural College, Pennsylvania Military College, Princeton University, Radcliffe College, Randolph Macon College, Rose Polytechnic Institute, Royal College of Science for Ireland, Smith College, South-western and St. Louis Universities, Throop Polytechnic Institute, Tufts College, the Universities of Arizona, California, the Cape of Good Hope, Chicago, Cincinnati, Illinois, Michigan, Minnesota, Missouri, Montevideo, Notre Dame, Pennsylvania, Vermont, West Virginia, Wisconsin, Vanderbilt University, Virginia Military Academy, Washington and Jefferson, William and Mary,

and Williams Colleges, Worcester Polytechnic Institute, Yale University.

The international contingent is again large and of interesting composition. Among the entering students are two from China, two from Japan, two from Chili, two from Uruguay, one from Italy, two from South Africa, two from England, and one from Ireland. One of the English students, Mr. Udale, is the first incumbent of the Walker Fellowship founded by citizens of Leicester. Mr. Udale is already a graduate of City and Guilds of London Institute, London University, and has had teaching experience. Five graduates of Annapolis are entering the course for Naval Constructors.

Former students having sons entering the Institute this year include Messrs. R. H. Soule, '72, F. W. Wood, '77, E. C. Miller, '79, Y. Bonillas, '84.

GENERAL NOTES

The sad death of Frank Harvey Cilley, a graduate from the Department of Civil Engineering in the class of '89, is noted elsewhere in this number of the REVIEW. By his will, dated April, 1905, and filed Oct. 13, 1905, he has established a liberal trust fund to assist in the development of the Walker Memorial Gymnasium. Mr. Walter S. Barker, of Cambridge, an intimate friend of Mr. Cilley, and Professors Burton and Noyes, of the Institute, have been named as executors and trustees under the will. The important provisions relating to the trust are as follows:—

All the rest and residue of my estate I give, devise, and bequeath to the said trustees in trust for the following purposes and uses:—

They shall in their discretion devote the income and such part of the principal as they see fit to the purchase of suitable books, photographs, casts, anatomical models, and statuary for the library and gymnasium of the proposed Walker Memorial Gymnasium of the Massachusetts Institute of Technology, or in their discretion they may expend from time to time a portion of said fund for special lectures on physical culture.

It is my intention and wish that the said trustees, while able personally to oversee the expenditures of such fund, shall gradually dispose of the whole principal thereof, or, if in their opinion the objects referred to can

be better accomplished by turning the balance at any time remaining in their hands of both principal and interest over to the Massachusetts Institute of Technology, then my said trustees have full power and authority so to pay over to the said Institute of Technology said trust fund, with all income and accumulations thereof, upon such conditions and understandings, if any, as they think proper to impose in order to carry out my purpose as herein expressed.

Though no inventory of the estate has yet been made, it is thought that the residue, which will constitute the trust fund, may amount to \$70,000. An additional amount of \$20,000 may be added to the fund on the death of certain annuitants.

DEPARTMENT NOTES

MINING

Professor Richards has been at the Lewis and Clark Exposition, Portland, Ore., since June, engaged in work for the United States Geological Survey upon the platinum-bearing sands of the West. Several concentrating machines have been set up there in a pavilion in the Mines Building, and experiments have been made upon the commercial recovery of the gold and platinum metals from these sands.

Professor Hofman and Mr. Locke were away during June in charge of the Summer School in Metallurgy, an account of which is given elsewhere. Since their return Professor Hofman has been engaged in putting into the form of an outline of metallurgy his courses delivered at the Institute, with some additional material which, for the lack of time, cannot be fully treated at present. By having a manual which conforms to modern theory and practice, much time will be saved to the student and the work, as a whole, will be strengthened.

Mr. Locke has devoted his time to the assaying of the sand and ore samples which the United States Geological Survey has collected from all over the country in connection with the platinum investigation. Several assistants have been engaged in this work all sum-

mer, and up to the present writing over a thousand samples have been tested. It is too early to publish results, but the work has been most interesting, and bids fair to result in much benefit to the placer miners and to the country as a whole. In connection with this work the material has passed through the hands of Professor Warren, of the Geological Department, who has made a careful mineralogical examination of each lot. Altogether an average force of seven men, consisting of members of the instructing staff and the class of 1905, has been employed.

Professor Lodge was engaged in some original investigations at the Institute until August 23, when he left for Portland, Ore.

Of last year's Assistants, Mr. Hollis left to become superintendent for the Eastern Talc Company at East Granville, Vt.; Mr. Litchman secured a permanent position in the Missouri zinc fields; Mr. Faulkner has been with the Standard Steel Works at Burnham, Pa.; Mr. Horton accompanied Professor Richards to Oregon, to assist in the work there; and Messrs. Brown and Reed helped in the platinum investigation at the Institute. Messrs. Brown, Faulkner, and Reed have returned as Assistants, and the Department has also secured the services of Mr. Hayden and Mr. Glidden of the class of 1905.

Owing to the uncertainty of the Institute's future, no changes have been made in apparatus which were not absolutely necessary. A high power electromagnet, with 100,000 ampere turns, has been installed for the separation of weakly magnetic ores.

An automatic side discharge has been placed upon the first sieve of the Harz jig.

The Wilfley table, purchased in Denver some years ago, has been replaced by a smaller table of the same type, but containing improvements designed by Professor Richards. This makes two of these tables now in the laboratory, and will prevent a recurrence of the annoying waits of the students last year for the use of this machine.

A small vertical boiler has been set up to supply steam to the drying tables during the summer months, while the large Institute boilers are shut down. It is a great advance over the former method

of drying ore in pans over a coke fire, where constant stirring by hand was necessary.

The old Fitchburg engine, which has done duty for so many years, has been taken out, and an electric motor, formerly used as auxiliary power, has been taken up from the sub-basement and installed in the engine-room to serve as the main source of power.

All of the Course III. men who graduated in June have secured employment. This is considered fortunate in view of the large size of the class and the increasing number of graduates from other institutions with whom they have to compete.

The library of the Department has again outgrown the additional shelf-room provided for it two years ago. A new case is being built, which will remedy this evil for a couple of years, but there remains the problem of further growth, as of the nineteen cases of the library two have had to be placed in the small office, which is crowded with its four writing-desks.

THE METALLURGICAL SUMMER SCHOOL OF 1905

This was the year for the Metallurgical Summer School which comes in alternate years. The time and money required for the attractive and successful George Crocker Mining School, held in Colorado last year, left fewer men able to attend this year. Moreover, a metallurgical trip is never so attractive to the students as a mining trip, and undoubtedly many Sophomores preferred to wait until next year. For all these reasons the number of students this year was small.

The party which left over the Fall River Line on June 7, consisted of Professor Hofman, Mr. Locke, Mr. Elliot, Mr. Rubel, and Mr. Suyehiro. After two days we were decreased to four, Mr. Rubel having secured a position, but a new member in Pittsburgh later restored us to five again.

Our headquarters for the first two days were at Hoboken, N.J. The first day, which was the most strenuous of the whole trip, was spent at the lead and copper smelter of the American Smelting and Refining Company at Perth Amboy. Six o'clock was the time

that we finished our inspection of the plant, which includes: (1) the refining of lead bullion and the smelting of lead products; (2) the electrolytic parting of gold-silver bullion; (3) the electrolytic refining of copper. It was midnight when we finished writing our notes.

The second day was devoted to the De La Mar Copper Company, Chrome, N.J., which has a large electrolytic copper refining plant.

One day was spent in a trip up among the New Jersey hills, to the New Jersey Zinc Company at Franklin Furnace, and in a study of the separation of the ore by magnets and washing, into zinc concentrate, manganese concentrate and waste rock.

We also had an opportunity to pass a quiet Sunday in this beautiful country, and look over the surface plants. Following this came a day at the smelter of this company at Hazard, Pa., where the zinc is recovered as metal and as oxide and the manganese is recovered as spiegeleisen. A contact sulphuric acid plant was an interesting feature here.

Another ride down the beautiful Lehigh Valley brought us to Philadelphia, where we saw the electrolytic refining of gold and silver in the United States Mint.

Two days in Baltimore were spent at the plant of the Maryland Steel Company at Sparrow's Point, one in visiting the coking and the blast furnace departments, the other in the Bessemer department, the rail mill, and the slag cement plant. Here the courtesies of the company's club were open to us, and the writing of notes on the broad piazza facing the Chesapeake Bay was a welcome change from the hotel.

A day's ride over the scenic Baltimore & Ohio landed us in Pittsburg simultaneously with a heavy thunder shower and a scorching hot wave. The former was of short duration, but we suffered with the latter for three days before it passed by. This city was the Mecca of our trip, and in the nine days spent there the following works and processes were seen: Carnegie Steel Company, Edgar Thomson Works at Braddock: blast furnaces, Bessemer department and rail mill; Carnegie Steel Company, Homestead Works at Homestead: open hearth plant, Bessemer plant and rolling mills

for all sorts of structural iron; American Sheet and Tin Plate Company, New Kensington Plant at New Kensington: the manufacture of black plate and tin plate; National Tube Company, Pennsylvania Department in Pittsburg: the making of steel pipe; Isabella Furnaces in Allegheny; the Gayley refrigerating plant for drying the air before entering the blast furnaces; Pittsburg and Buffalo Coal Company, Hazel Mine at Canonsburg: the mining, screening, and shipping of bituminous coal; Crucible Steel Company of America, Crescent Works in Pittsburg: the puddling process and the manufacture of high-grade steel; Sable Iron Works, Pittsburg: puddling; Pittsburg Malleable Iron Company: the malleabilizing of castings.

For a holiday we spent an afternoon on the site of the Pittsburg filtration plant now under construction. Here Tech men are much in evidence, from the superintendent, Mr. Morris Knowles (M. I. T. '91), down. As his guests, we were present that evening at a most enjoyable informal reunion of about twenty Tech men, which partook of the nature of a Kommers, and was followed by a walk to obtain a view of the city by night from Mt. Washington.

The small size of the party was a distinct benefit to the individual members. They had a much better opportunity to see things and obtain information than they would have had if the number had been larger, and at the breaking up on June 27 each expressed himself as highly pleased at the results.

Everywhere we were met with open hands, and our thanks are due to the officials of the works for the many courtesies extended.

RESEARCH LABORATORY OF PHYSICAL CHEMISTRY

The Research Laboratory of Physical Chemistry has suffered a severe loss in the resignation from its staff of Professor W. D. Coolidge, who has accepted an attractive position in the technical Research Laboratory of the General Electric Company at Schenectady, where he will be closely associated with Professor W. R. Whitney. To Professor Coolidge has been due the development of one of the most important lines of work in progress in the Institute's Research Laboratory,—the investigation of the conductiv-

ity of aqueous solutions at high temperatures,—a research that will be continued not only by several investigators at the Institute, but also by Professor Coolidge at Schenectady.

Mr. Yogoro Kato, who has also been engaged on the conductivity investigation for two years, has accepted a position in the leading technological institute in Japan, the Technical High School of Tokio, where he will have charge of the work in inorganic chemistry and electro-chemistry. Dr. Wilhelm Böttger returns as Privat-Docent to the University of Leipzig, at which he will conduct one of the laboratory courses in analytical chemistry.

In place of these retiring members the following new appointments to the research staff have been made: William C. Bray, B.A., Toronto, '02, Ph.D., Leipzig, '05; Guy W. Eastman, S.B., M. I. T., '04; Gilbert N. Lewis, Ph.D., Harvard; Edward W. Washburn, S.B., M. I. T., '05. Mr. Roy D. Mailey has been promoted to position of Research Associate.

Arrangements have been made with Professor Wilhelm Ostwald, who is engaged during the present term as lecturer at Harvard University, to deliver at the Institute a course of six lectures, beginning on November 9, on the Historical Development of Chemistry. The whole instructing staff of the Institute and all graduate and fourth-year students in Chemistry and Physics will be invited to attend.

At the close of the last school year a second gift of two hundred dollars was received from Mr. Samuel Cabot for use in promoting the investigations in the Research Laboratory.

Seven candidates for the degree of Doctor of Philosophy are now pursuing work in the laboratory.

The researches described in a preceding number of the REVIEW are all being continued, and one new line of investigation has been entered upon,—that of the hydration of salts in aqueous solutions. This constitutes one of the most important as well as one of the most difficult of the unsolved problems relating to solutions, and is being attacked by two independent methods, both of which give promise of success, by Mr. Edward W. Washburn and Mr. Richard C. Tolman. A series of eight articles describing the researches

made in the laboratory during the last two years is about to be submitted to the Carnegie Institution for publication.

GEOLOGY

Professor Jaggar was occupied during the summer with the completion of a geologic folio for the United States Geological Survey. This folio will contain maps, sections, and descriptive text of the mining district of the northern Black Hills, South Dakota, in the vicinity of the towns of Deadwood, Sturgis, and Spearfish. It is the product of two seasons' field work, and includes all of the ore-bearing formations in the vicinity of the Homestake Mine.

Professor Crosby was engaged in the investigation of the auriferous formations of Admiralty Island and the Juneau district in Alaska, and later examined some gold mines in Shasta County, California. He has published during the year:—

"The Limestone-Granite Contact Deposits of Washington Camp, Arizona": Transactions of the A. I. M. E., Vol. XXXVI. (Victoria Meeting, July, 1905); *Technology Quarterly*, Vol. XVIII., No. 2, June, 1905, pp. 171-190.

"Genetic and Structural Relations of the Igneous Rocks of the Lower Neponset Valley, Massachusetts": *American Geologist*, Vol. XXXVI. pp. 34-47, 69-83; *Technology Quarterly*, December, 1905.

Dr. Warren, in the Mineralogical Laboratory, has been engaged through the greater part of the summer in making a mineralogical examination of river and sea sands and ores chiefly from the Pacific States, under the auspices of the United States Geological Survey. Several economic problems connected with building stones have also occupied a portion of his time.

Before the close of the last semester, Professor Johnson completed a bulletin for the United States Geological Survey on "The Relation of the Law to Underground Waters," which has been published; a report on "The Tertiary History of the Tennessee River," published in the *Journal of Geology*, Chicago; a paper on "The Distribution of Fresh Water Faunas as an Evidence of Drainage Modi-

fications," published in *Science*, New York City; and a paper on "The Biological Evidence of River Capture," published in the *Bulletin*, American Geographical Society, New York City. During the summer he completed a short paper on "Youth, Maturity, and Old Age of Topographic Forms," which will be published in the *Bulletin*, American Geographical Society, New York, in the near future. In the early summer he spent a month in the Southern Appalachian Mountains of North-eastern Georgia and Western South Carolina, making a study of drainage modifications in the head-waters of the Savannah and Chattahoochee Rivers. The results of this work are now being prepared for publication. Most of the summer was spent in equipping the course in topographic geology,—selecting and purchasing maps, lantern-slides, etc., superintending the mounting and grouping of maps for class use, the framing of pictures, drawing maps for use in lecture-room, etc., etc. A card index to literature of topographic geology and allied subjects, containing nearly five thousand classified references, was prepared, and will be available for use by students in topographic geology. A private gift of \$350 for the work in topographic geology has made possible the purchase of much-needed maps, the mounting on cloth of maps previously purchased, the framing of certain special maps and photographs, and the purchase of lantern slides. With this added equipment the work in Topographic Geology can be made more effective than in the past. At the same time the course has been extended throughout the entire year instead of a half-year, as heretofore. The large framed pictures and maps will add to the good appearance of laboratory and lecture rooms, besides serving an important purpose in the regular work.

Dr. Shimer spent part of the summer in remodelling and simplifying his lecture notes on Structural Paleontology with a view to publication after an additional year's delivery to the students. He visited type stratigraphic localities in New Jersey and Pennsylvania, and began the stratigraphic working map of the Cortland quadrangle for the New York State Survey. He expects to continue this year the work on the fossils and fossil-bearing localities of Eastern Massachusetts. He has in press with the *American*

Naturalist a short article, with drawings, on a peculiar Alaskan brachiopod. A longer one, with drawings, on "Old Age in Brachiopods" goes to the same magazine in a few days.

MATHEMATICS

Professor Wells, whose teaching is now completed in the first term, has spent the spring and summer in Europe.

Mr. E. A. Miller, instructor in mathematics, has returned after a year of successful work in Göttingen to continue graduate study at Harvard University.

NAVAL ARCHITECTURE

Mr. John A. Ross (Course XIII., 1901) has been appointed Instructor in Naval Architecture, and will assist Professor Hovgaard in Warship Design. Mr. Harold A. Everett, Instructor in Naval Architecture, has spent the summer at the ship-yard of Denny & Co. at Dunbarton, Scotland, and also visited important ship-yards in Germany. Mr. W. S. Leland, who has had charge of instruction in ship design and ship construction, has been made Assistant Professor of Naval Architecture. Five ensigns have been detailed to take up instruction in naval construction, forming the entering class in that course this fall.

THE GRADUATES

THE TECHNOLOGY CLUB OF NEW YORK

An enjoyable excursion was held on September 9 to the Bronx Zoölogical Park, followed by a dinner at the Hermitage.

Our season opened with a series of class meetings at the club-house. Classes '68 to '85 met on Thursday, September 14; '86 to '89 on Monday, September 18; '90 and '91 on Thursday, September 21; '92 and '93 on Monday, September 25; '94 and '95 on Thursday, September 28; '96 and '97 on Monday, October 2; '98 and '99 on Thursday, October 5; '00 and '01 on Monday, October 9; '02 and '03 on Thursday, October 12; and '04 and '05 on Monday, October 16.

The House Committee for the current year is D. W. Edgerly, chairman, Allston Sargent and Morgan Barney.

Delano, '05, is living at the club, and the first of his class heard from in New York.

ALEX. RICE MCKIM, '86, *President*,
36 East 28th Street, New York, N.Y.

THE TECHNOLOGY CLUB OF PHILADELPHIA

The Tech Club of Philadelphia has not met as yet to plan the winter's campaign, but now that vacations are over the secretary is looking forward to a season of greater activity than last, which in some ways disappointed him, in spite of the success of the annual dinner in March. More informal meetings will be held this winter, and an earnest endeavor will be made to make these meetings interesting to the members.

Any Tech man, whether a member or not, will be welcome at these meetings, and the secretary will be pleased to have the address of any who may be in this locality for a short time only, that he may inform him when and where the meetings are to be held.

J. R. DANIELL, '97, *Secretary*,
Woodbury, N.J.

THE M. I. T. CLUB OF CINCINNATI

The annual summer outing of the Cincinnati M. I. T. Club was held at Germantown, Ohio, at the invitation of J. Hildeboldt. Mr. Kittredge, chief engineer of the Big Four Railroad, was so good as to place a private car at the disposal of the party, and a very pleasant day was spent in Germantown and the country around.

A special meeting of the club was held at the Zoo Gardens, to take a vote on the question of merger with Harvard, and we were pleasantly surprised to find Professor Swain there as the guest of Mr. Kittredge, Mr. Swain having come on with the Commercial Club of Boston.

A. H. PUGH, '97, *Secretary*,
1912 Madison Road, Cincinnati, Ohio.

THE TECHNOLOGY CLUB OF NEW BEDFORD

The Technology Club of New Bedford was organized on Dec. 30, 1904, with seven members. The officers are Theodore F. Tillinghast, '70, president; Charles F. Wing, Jr., '98, secretary and treasurer; and C. F. Lawton, '77, and the officers, executive committee. Since organizing, the club has held a number of meetings at which affairs pertaining to the merger have been actively discussed. In January a dinner was held, at which Professor Harry Clifford was the principal speaker, and entertained the members with a characteristic talk on the merger.

To-day the club numbers eighteen. All Technology men of New Bedford and vicinity are requested to send their names to the secretary, and notices of meetings will be sent them. At our annual dinner in November we expect to have a large number present, and hope to get the latest news of Alma Mater from some of our old friends, the professors.

CHARLES F. WING, JR., *Secretary*,
34 Purchase Street, New Bedford, Mass.

NOTES

Graduates of M. I. T. with military capacity are requested to apply to Major Wheeler, if they wish positions as officers in Philippine scouts at \$1,100 per year.

Science for September 15 contains a tabulation of doctors' degrees given by the principal American universities and a list of recipients of the degree in 1905. It is interesting to note that among these are the following five graduates of the Institute:—

F. L. Bishop, Course VIII., '98, at the University of Chicago, presenting a thesis on The Thermal Conductivity of Lead.

B. A. Lenfest, Course II., '90, at Yale University, presenting a thesis on The Accuracy of Linear Movements.

J. G. Coffin, Course VIII., '98, at Clark University, presenting a thesis on Construction and Calculation of an Absolute Standard of Self-inductance.

H. A. Pressey, Course I., '96, at George Washington University, presenting a thesis on Flow of Water in Channels.

N. A. Du Bois, Course V., '01, at Brown University, presenting a thesis on Some Condensation Products of (1) Phenyl-naphthalene, (2, 3) Dicarboxylic-anhydride.

NEWS FROM THE CLASSES

1874.

CHARLES F. READ, *Sec.*, Old State House, Boston, Mass.

A quarterly lunch of the association of the class of 1874 was held at the Boston Club on Monday, September 18, by invitation of Mr. George H. Barrus, president of the association, and who is also a member of the club. Fourteen members were present, they being, in addition to Mr. Barrus, Messrs. Arnott, Baldwin, Brown, Burrisson, Chase, G. T. Elliot, Magee, Mansfield, Nickerson, Read, Robinson, Russ, and Warren. At the meeting Messrs. Samuel J. Brown and John L. Faxon, the well-known architects of this city, were elected members of the association, both having been special students in the class of 1874 at the Institute in the days of "auld lang syne."—Messrs. John C. Chase and Charles F. Read have been elected presidents respectively of the Chase and Reade family associations, both being deeply interested in the delightful study of genealogy.—An interesting sketch of George H. Barrus, the well-known consulting engineer of this city and president of the association, appears in *Cassier's Magazine* for June, 1905. The article deals with the successful professional career of Mr. Barrus, and his photograph, a most excellent one, forms the frontispiece of the magazine.—Charles D. Austin is residing at present in Kansas City, Mo., where he is superintending the erection of a large building.—Francis H. Silsbee, of Lawrence, has been visiting Europe during the past summer.—William B. Dowse hopes to start on his trip around the world before the close of the year. He bears a commission from the association to endeavor while in the Hawaiian Islands to see Joseph B. Emerson, and while in Japan to see Mr. Aechirau Hongma, both of whom graduated from the Institute in the class of 1874.

1877.

RICHARD A. HALE, *Sec.*, Lawrence, Mass.

E. G. Cowdrey, '77, manager of Laclede Gas Light Company of St. Louis, and daughter were in a train wreck in the New York Central tunnel recently, but fortunately escaped with slight bruises.—The secretary of '77 recently had the pleasure of spending the night at the Harvard Engineering School camp at Squam Lake, N.H., in connection with some professional work at the lake, and met Professor H. J. Hughes, in charge of the school, together with many other Harvard men. In general conversation with the men the atmosphere was decidedly chilly in connection with the Harvard-Tech merger, and very little sympathy was shown in the movement to unite the schools as suggested.—We regret to announce that the wife of Councilman Henry D. Hibbard, '77, died at Plainfield, N.J., August 29, after a short illness. She leaves two children, Dorothy and Lyman, in addition to the husband. Mr. Hibbard has the sympathy of all the members of '77 in his loss and change in his attractive home in Plainfield.—A cordial letter has been received from W. A. Hallett, '77, of the Washoe Copper Company sampling works, Butte, Mont., in which he expresses the hope that he may attend the next annual class meeting of '77, and sends greetings to the boys.

1878.

LINWOOD O. TOWNE, *Sec.*, Haverhill, Mass.

As of '78, the members are much interested in the candidature of Eben S. Draper as Lieutenant-Governor of Massachusetts. His many friends in '78 and out of it are hoping for the best results for our genial classmate.

1883.

HARVEY S. CHASE, *Sec.*, 27 State Street, Boston, Mass.

Horace B. Gale was married on July 25 to Miss Eastman, of Keene, N.H., at the latter place. Members of the class attended

the wedding, which was a very friendly and delightful affair. Mr. Gale is engineer and superintendent of the Submarine Signal Co. at 247 Atlantic Ave., Boston.

1885.

I. W. LITCHFIELD, *Sec.*, 161 Devonshire Street, Boston, Mass.

'85 celebrated its twentieth anniversary in camp at Little Squam Lake, N.H., June 15, 16, 17, and 18. The delegation consisted of Ames, Baker, Brown, Dewson, Fry, Fred Kimball, Jim Kimball, Litchfield, Little, McKim, Morss, Mullins, Pickernell, Pierce, Pratt, Richards, Richardson, Steele, Talbot, Worthington. By common consent, Rob Richardson was elected Magnum Gazabo, and he named his cabinet as follows—

Prevaricator-in-chief and First Assistant Gazabo	IKE LITCHFIELD
Chief of Police and Official Chambermaid	CHARLIE RICHARDS
Chaplain and Spirituous Adviser	DICK PIERCE
Chancellor of the Exchequer }	
Guardian of the Deficit and }	EV. MORSS
Overseer of the Poor }	
Commander of Artillery }	
Promoter of Puerile Pastimes and }	OAKES AMES
Caddie of the "Hillside Golf Club" }	
Artist-in-chief and Main Mug Snapper	BILL MULLINS
Fleet Captain and Official Poisoner	RAS WORTHINGTON
Flag Lieutenant and Forewoman of the Laundry Department, ED. DEWSON	
Surgeon-general and Queen of the May	ARTHUR LITTLE
Health Commissioner and Official Taster	HARRY TALBOT
Tonsorial Artist and Barber	FRANK PICKERNELL
Sanitary Engineer and Scavenger-in-chief	ALEX MCKIM
Chief of Fire Department and Milkmaid to the Royal Cow, GEORGIE STEELE	
Chief Executioner and Director of the Orchestra	FRED KIMBALL
Head Forester and Wood Chopper to his Royal Nibs	JIM KIMBALL
Horrible Example and Driver of the Water Wagon	BERT PRATT
Quartermaster-general and Custodian of the Royal Pie Plates,	
	CHARLIE BROWN
Official Costumer and Keeper of the Royal Whiskers	TOM FRY

Neither time nor space permits to detail here the records of Camp Walker, which for the benefit of posterity have been embalmed in prose and poetry of our own make. This book can be had on application, accompanied by thirty cents in stamps as evidence of good faith. The Log of Camp Walker is fully illustrated, and appears as a supplement to "The '85 Hustler."—W. D. Fuller, of Los Angeles, Cal., visited the East this summer, but, alas! too late for camp.—Fred Kimball boiled out some of the pictures taken in camp, and will show them as lantern slides at a class dinner this winter. They are worth going miles to see. Preparations are already in progress for the twenty-fifth anniversary, and it is a source of universal regret among those who went to camp this summer that it does not occur next year.—Fiske is with the Missouri & Kansas Telephone Company, located corner Sixth and Wyandotte Streets, Kansas City, Mo.—F. E. Sands is with Sands, Taylor & Wood Company, 131 State Street, Boston.—In the report of the Fifth International Congress of Applied Chemistry, held in Berlin, is a paper by Arthur D. Little on "The Cellulose Industries of the United States."—Merrill, who has been acting secretary of the Institute during Dr. Tyler's absence, was tied to the office when we wanted him in camp.—A new company, known as the E. H. Mumford Company, has been formed at Philadelphia, Pa., for the manufacture of moulding machinery. The new company has located at Seventeenth and Callowhill Streets, and new and superior moulding machines will be made. The company is composed of E. H. Mumford and C. S. Lovell, formerly of the Tabor Manufacturing Company.—Winthrop Packard has become the editor of the *New England Magazine*.

1888.

WILLIAM G. SNOW, *Sec.*, 6305 Sherwood Road, Philadelphia, Pa.

William H. Blood, Jr., has been elected president of the National Electric Light Association.—Sanford E. Thompson and Frederick W. Taylor have prepared a treatise on "Concrete Plain and Reinforced," published by John Wiley & Sons, New York. The book of 585 pages contains chapters by R. Feret, William B. Fuller, and Spencer B. Newberry, and is designed for practising engineers and contractors, and also for a text and reference book on concrete for engineering students.—The death of Ralph M. Fay, vice-president of the Ætna Powder Company of Chicago, occurred Nov. 1, 1904, at Plymouth, Mass., at the home of his father. He was in poor health for a year previous to his death, which was due to Bright's disease. He was unmarried.—William G. Snow, during a recent trip to the Pacific coast, had a pleasant call on Samuel G. Neiler in Chicago, where he is engaged in general mechanical and electrical engineering practice in the firm of Pierce, Richardson & Neiler. In Portland, Ore., Snow had the pleasure of seeing John E. Young for the first time since graduation. Young is engaged in the wholesale woollen business, but finds some time for other things, being a prominent member of the Arlington Club and president of the Waverly Golf Club, which has one of the finest eighteen hole courses on the Pacific slope. The Lewis and Clark Golf Tournament was held there in June. A few days were spent in Tacoma and Seattle, where a number of Tech men were met, most of them coming from the East to assist in the upbuilding of electric power lighting and railway properties managed by Stone & Webster. Among the principal of these are the Puget Sound Power Company, the Puget Sound Electric Railway, the Tacoma Railway and Power Company, and the Seattle Electric Company. These companies have issued \$12,873,000 in bonds and \$16,526,200 in stock, operate nearly 250 miles of equivalent single track, and do a large and growing business in supplying electric light and power. These utilities are sold at such a

rate that few, if any, isolated mechanical and electrical plants have been installed in office and other buildings. All indications point to a great future for Puget Sound ports. The physical condition of the above-mentioned properties speaks well for the management.

1889.

PROF. F. A. LAWS, *Sec.*, Mass. Inst. of Technology, Boston.

All members of '89 will be pleased to know that the Institute is to profit by the experience in practical and pedagogical lines of another member of the class, for William E. Mott returns to the Department of Civil Engineering as associate professor of hydraulics. Professor Mott comes to the Institute from the College of Civil Engineering, Cornell University, where, beginning with the position of instructor in applied mechanics, 1892 to 1899, he was appointed assistant professor of hydraulics in 1900. Of late all his work has been in this department. During the year 1903-04, on leave of absence from Cornell, he studied abroad, spending the major portion of his time at the Polytechnikum in Zürich. At the Institute Professor Mott will assist Professor Porter.—Professor F. H. Thorp of the Institute has published, through the Macmillan Company of New York, a new edition of his work on "Industrial Chemistry." It was issued last May. The book contains 618 pages, an increase of seventy-seven pages over the first edition and there are nineteen new cuts. The entire text has had more or less revision and alteration, and a new chapter upon Electric Furnace Products has been inserted. The chapters on Electrolytic Chlorine, Catalytic Processes for Sulphuric Acid and Cyanides, have been rewritten, and much new matter added throughout the book. The largest increase is in a new Part III. upon the subject of Metallurgy, the material for which was chiefly prepared by Charles D. Demond, '93, testing engineer of the Anaconda Copper Company, at Professor Thorp's request. This chapter is of an elementary nature, and is intended to meet the requirements of certain colleges where distinct courses in Metallurgy as such are not carried on, but are included in the

course of Industrial Chemistry. In this edition a thinner paper than that used for the previous issue has been used, so that, notwithstanding the greater number of pages, the book is somewhat less bulky than before.—The following item concerning our classmate Estabrook is from the Boston *Herald* of August 15:—

Willard W. Estabrook, a young Boston business man, for many years a resident of Brookline, was yesterday appointed fire commissioner of Brookline, to succeed B. W. Neal at the expiration of the latter's term of service next month. Commissioner Neal resigned because of the pressure of business, he having been at the head of the Brookline fire department since its reorganization several years ago.

For many years Mr. Estabrook has been an earnest student of matters pertaining to the fire department of all the large cities of this and other countries, and is an intimate friend of Fire Commissioner Wells, of Boston.

—Kilham & Hopkins are now engaged on plans for improvements on ex-President Cleveland's farm which he has recently purchased at Tamworth, N.H.

1890.

GEORGE L. GILMORE, *Sec.*, Lexington, Mass.

Following clipping is from a Grangeville (Ida.) paper of June 20:—

Rev. Willard Roots, late pastor of Trinity Episcopal Church of this city leaves to-morrow for Palouse, Wash., where he will make his home in the future. It may be arranged for him to include Pullman also in his work, as they have a church, but no pastor, and not a particularly strong congregation. Mr. Roots, during his stay here, has made a more than local reputation as a strong pastor, while his work in the Sunday-school and for civic virtue has been exceptionally good. He has made a host of friends, both in and out of the church, who wish him well in his new work. The new appointment comes as a decided promotion. He will be on the advisory board of this diocese, with the dean of the Episcopal cathedral of Spokane as his associate.

1892.

PROF. WILLIAM A. JOHNSTON, *Sec.*, Mass. Inst. of Technology.

It is with sincere regret that your secretary records the death of Thomas Crane Wales, Jr., one of the most popular members of the class of '92. His death, coming as it did suddenly after an operation for appendicitis at Boothby Hospital, Boston, was a great blow to his many friends. A brief account of his life has been prepared by Frederick L. Rhodes and Charles F. Wallace, and will be found elsewhere in the REVIEW, Wallace having known Wales intimately up to the time of his graduation from the Institute, while Rhodes was in closer touch with him since that time.

1893.

FREDERIC H. FAY, *Sec.*, 60 City Hall, Boston.

Orton W. Albee, who is associated with C. C. Bothfeld, '84, of Detroit, in consulting work on iron and steel structures, has gone into the wilds of central Ontario to open up and develop a silver mine in which Mr. Bothfeld and others are interested. The building of a new railway through this region led to the discovery of the mine, which is located some three miles from the railway line. Although he will make frequent trips to the States, Albee expects to spend a considerable part of the coming winter in the Canadian woods.—Stephen A. Breed has been appointed instructor in the department of drawing and descriptive geometry at the Institute.—In the engineering staff of the Panama Canal the class is represented by Carleton E. Davis and Arthur M. Burt. For considerably more than a year Davis has been upon the isthmus as engineer in charge of water-works and sewers, and the work accomplished during that time by his department has received high praise. Recently Arthur Burt, of Lowell, has been appointed supervising architect of the Isthmian Canal Commission. The offices of both Burt and Davis are at Ancon, Canal Zone, Panama.—Herbert N. Dawes returned

late in September from an extended vacation in the West. He left Boston early in August, went over the Great Lakes to Duluth, and thence to Sheridan, Wyo., at which place he spent several weeks on a ranch in the Big Horn Mountains, fishing in the mountain streams and riding the Western horses. He claims to have been able at least to hold his own with the rest in sitting in the saddle, which he did almost continually while there. After leaving the ranch, he went through the Yellowstone National Park, and he returns deeply impressed with the wonderful things he saw in this Nature's Wonderland.—The engagement is announced of Miss Annie Louise Walley, of Boston, to Edward Dana Densmore. Their marriage will occur on the 24th of October.—J. Fred Hinckley has had the sad misfortune to lose his wife, who died some months ago, leaving one child, a boy three years of age. Mrs. Hinckley was a Baltimore girl, and it was there that Hinckley was located at the time of their marriage, in 1897. Most of their married life had been spent in Brooklyn, however, as for several years Hinckley was chemist for B. T. Babbitt, of New York. Recently he has become chemist for Jones Brothers of Brooklyn, and he carries on as well a practice as consulting chemist in soap manufacture. A tribute to his professional standing in this branch of industrial chemistry was paid him by the publishers of the Century Dictionary, who selected him to edit and revise for that work the terms relating to the soap industry.—Two '93 chemists are prominently identified with investigations in connection with public water supplies. Daniel D. Jackson, chief chemist of the department of gas, electricity, and water supply, Brooklyn, N.Y., has been experimenting upon the effect of copper sulphate in the purification of water. At the annual convention of the American Society of Municipal Improvements, held at Montreal in September, he presented a paper upon the subject which was subsequently published in the engineering press. The following week, at the annual convention, in New York, of the New England Water Works Association, Jackson was one of the speakers in the "Symposium on the Relation of Copper Sulphate to Water Supply Matters," and to which J. W. Ellms also contributed a paper. Ellms, who is chemist for the commissioners of water-works of Cincinnati, has served as

a member of a committee of the American Public Health Association, which has made an important report outlining standard methods to be followed in water analysis. To judge by the composition of this committee, it would seem that Institute men are especially prominent in sanitary affairs of the country, for, out of a membership of seven, five members are Tech men, the others being George W. Fuller, '90, chairman, George C. Whipple, '89, secretary, and H. W. Clark, '88, and R. S. Weston, '94.—Charles M. Spofford went to Brooklyn, N.Y., about the middle of September to begin his duties as professor in charge of the department of civil engineering of the Brooklyn Polytechnic Institute. The greater part of his summer was given to professional work with the engineering department of the city of Boston, although he made week-end visits to Casco Bay, Me., where his family spent the season. At the June meeting of the Boston Society of Civil Engineers Spofford presented a paper upon "The Making of Structural Steel."

1894.

PROF. S. C. PRESCOTT, *Sec.*, Mass. Inst. of Technology, Boston.

Professor H. B. Dates, dean of the Engineering School of the University of Colorado, has accepted a professorship of electrical engineering at the Case School of Applied Science.

1895.

WILLIAM T. HALL, *Sec.*, Mass. Inst. of Technology, Boston.

C. D. Waterbury (Course IV.) was married on September 20 to Miss May Louise Dickerman, a sister of J. C. Dickerman (Course X.).—H. D. Jackson is busily engaged reorganizing an electric light plant in Leominster, Mass.—W. H. Watkins has been transferred to Buffalo, where he has charge of the dyeing department of Schoellkoff, Hartford & Hanna.—David B. Weston is with Charles Stone, of Chicago, and is interested in the manufacture of beet sugar.

1896.

EDWARD S. MANSFIELD, *Sec.*, 70 State Street, Boston, Mass.

During the month of July Messrs. M. L. Fuller and F. G. Clapp, of the United States Geological Survey, made a reconnoissance trip through Newfoundland and along the coast of Labrador to a point north of Hopedale for the purpose of comparing the glacial features with those of the north-eastern United States. Several interesting points relating to possible pre-Wisconsin deposits, to the origin of the high terraces, and to the recentness of the last glaciation, were brought out. The intention was to go further north, but this was impossible because of the presence of unusually heavy pack ice along the shore, from which the vessel was obliged to withdraw after penetrating it for a distance of some ten miles.—M. L. Fuller writes that on July 21st, while Boston was indulging in some of her hottest weather, he was fast in the pack ice off the coast of Labrador. Previous to this he had spent some months in an investigation of artesian waters in the lower Mississippi Valley for the United States Geological Survey, leaving only a short time before the outbreak of yellow fever.—Franklin Hayes Davis died at Great Barrington, Mass., of heart failure on June 23, 1905, aged thirty-five years. He was graduated from the Institute in 1896, taking his degree in Course III., and immediately afterwards accepted a position with the United States War Department, with headquarters in Philadelphia. His work here included, among other things, the testing of the strength of materials, which ultimately led to a better position with the Midvale Steel Company. Here he developed the armor plate plant, and at the time of his death held the position of superintendent of that department. A too close application to business undermined his health, and about June 10 he came to Massachusetts for his health, but all in vain. He was a native of Albany, N.Y., but had more recently resided in Germantown, Pa., where the body was taken for interment. A wife and family survive. During his course at Tech Mr. Davis

showed the characteristics of a quiet, industrious, and conscientious worker, which were the foundation of his later success. We all remember his unassuming disposition, and grieve that his life has been cut off just as he was achieving his greatest success.—A letter from Charles Morris, Jr., dated San Diego, Cal., August 9, speaks of the already familiar disaster of the United States steamship "Bennington" of which he was paymaster. The complement of the ship was reduced from two hundred to about eighty. Mr. Morris was fortunately uninjured.—At the Institute '96 shares in the list of promotions, being represented by Walter S. Leland, who has been made assistant professor of naval architecture.—J. L. Matthews, at one time with '96, is now on the editorial staff of the *Youth's Companion*. Matthews is married, and has a residence in Billerica, Mass.—Eugene C. Hultman has received the Republican nomination for representative from Quincy. He served one year in the City Council of Quincy and several years on the Republican Ward and City Committee. He is a 32d degree Mason, and is president of the fencing club of the Boston Y. M. C. A.

1897.

JOHN A. COLLINS, JR., *Sec.*, 74 Saunders Street, Lawrence, Mass.

E. P. Osgood, who, it will be remembered, went to Siam a few years ago, is to return to the United States. Perhaps he is in this country even now. The secretary received a letter from him, dated July 3, in which he speaks of leaving shortly. On the way, however, he was to visit relatives in Hong Kong and the Philippines, so he may not have arrived as yet. During a part of his work there in Bangkok he served as one of two foreign members of a Boundary Commission that delineated a portion of the eastern frontier under the terms of the new treaty with France. Much of the work was in the deep jungle and in the Cardamon Mountains.—The engagement is announced of Jere Rogers Daniell (Course XIII.) to Miss Anna Harding Lippincott, of Woodbury, N.J.—Dr. Mortimer Frank was married on October 4 to Miss Donie Katz, daughter of Mr. and Mrs. Henry Katz, of Chicago.

1898.

PROF. C.-E. A. WINSLOW, *Sec.*, Mass. Inst. of Technology, Boston.

Russell was married on Wednesday, June 7, in Chicago, to Miss Sarah Estelle Knapp, daughter of Mr. and Mrs. G. O. Knapp.—Since June 1 the business of John Parkinson, architect, has been conducted under the firm name of John Parkinson & Edwin Bergstrom, with offices at 1215 Braly Building.—Hawes is now drafting with the Honolulu Iron Works Company at Honolulu, Hawaiian Islands.—Shedd was married on Thursday, June 15, in Chicago, to Miss Ellen Lovira Collins, daughter of Mr. and Mrs. Martin Haynes Collins. Mr. and Mrs. Shedd will be at home at 6512 Stewart Avenue, Chicago, after November 1.—Philbrick's address is changed to 300 Old Colony Building, Chicago.—Tew's address is now 55 Waterloo Street, Glasgow, Scotland.—Innis has moved from Mattapan to 11 Wareham Street, Boston.—Pen Dell is now factory engineer at the Clinton Street factory of the Western Electric Company, Chicago.—Hutchinson has removed from Copper Hill, Tenn., to Prescott, Ariz.—A despatch to the Boston *Herald* from Worcester, under date of August 8, is as follows:—

Arthur A. Blanchard, of Newton Centre, and Miss Eugenie Maud Lord were married at the home of the bride's mother, 3 Berkshire Street, this evening, by Rev. Dr. A. B. Chalmers, pastor of Plymouth Church. The best man was Miles Sherrill, and the bridesmaid Miss Grace Maynard. The ushers were Paul Lord, of Dorchester, Paul Chapin, of Leominster, and Edgar Sherrill, of Brookline. The groom is an instructor in the Massachusetts Institute of Technology, and the bride was formerly a teacher of music in Gambia, Ohio. Mr. and Mrs. Blanchard will live at 66 Oxford Road, Newton Centre.

—J. G. White & Co. have issued the following biography of '98's first marshal:—

Mr. Wadsworth was born in 1875, and in 1898 graduated from the Massachusetts Institute of Technology in civil engineering. He entered the employ of the New York Central Railroad at Albany, being assigned to the office of division engineer, in which he worked in various capacities, ulti-

mately being appointed assistant engineer. In 1901 he was transferred to the general office in New York on special work under the engineer of track. Shortly afterwards he was made resident engineer of the Middle District at Albany in charge of construction work. In 1902 Mr. Wadsworth was appointed designing engineer of the company, with headquarters at the Grand Central Station. Here he had the supervision of plans and estimates for bridge masonry, culverts, piers, bulkheads, and yard and shop lay-outs. In 1903 he was placed on the New York Terminal Improvement as assistant engineer, having charge of the construction of the "Port Morris Branch Depression" in the Bronx, the "Marble Hill Cut-off" in Upper Manhattan, and general improvements in four tracking. Early in 1905 Mr. Wadsworth was appointed resident engineer of the Hudson District, in charge of contract work connected with the Terminal improvements from Mott Haven to Croton. Since graduation Mr. Wadsworth has been continuously in the employ of the New York Central, and his rapid promotion has given him an unusually wide experience for a man of his age.

Mr. Wadsworth is associated with J. G. White & Co. as assistant to the construction manager, and will make his headquarters at the home office of the company, 43 Exchange Place, New York City.

—On August 11 Fownes gained distinction in the third round of the Eleventh National Golf Tournament by defeating Walter Travis, the former National and British champion in a hard round, decided only at the nineteenth hole. In the semi-finals Fownes was defeated 2 up by D. E. Sawyer, of Chicago.—H. W. Jones, M.D., has been appointed assistant professor in the department of surgery, St. Louis University Medical School, and consulting orthopedic surgeon to St. Anne's Infirmary, St. Louis.

1899.

DR. MILES S. SHERRILL, *Sec.*, Mass. Inst. of Technology, Boston.

W. O. Sawtelle has resigned his position as instructor in physics at the Institute, and has removed to Cambridge, where he will be engaged in post-graduate study and research at Harvard University.—George R. Townsend is assistant to the works manager of the Power and Mining Machinery Company at Cudahy, Wis.

1900.

R. WASTCOAT, *Sec.*, Dedham, Mass.

In order to make this part of the REVIEW of interest, it is hoped that personal modesty will not prevail among our members. If anything "occurs" to you or yours, don't let the secretary get it second-hand, but write him personally, as then there is less possibility of error. He wants to thank those who have helped so far in providing any items of interest. There are many of our members who are not subscribers to the REVIEW who, if they had this department called to their attention, would send in their subscriptions. If you run across any of our members, can you not call this department to their attention, as it will increase the interest in class matters?—Batcheller, III., who has been interested in mining in Alaska, has been in town the latter part of the summer.—At the last meeting of the Tech Society of Western New York, in Buffalo, last May, two 1900 men were present, Vogel, I., and Sanders, V. Sanders is in the employ of the Larkin Soap Company at Buffalo.—The secretary has received notice of the death of Charles E. Morton, May 9, 1905. It is hoped to receive further particulars in regard to his decease.—Willard F. Jackson, lately connected with the engineering office of Purdy & Henderson, 101 Tremont Street, Boston, has recently accepted a position in Philadelphia. Beekman, IV., is chief draughtsman, and in charge of the draughting department of the Boston branch of the above firm.—H. A. Macpherson, XIII., has accepted a position in the inspection department of the Western Electric Company, Chicago, leaving the Fore River Ship and Engine Company where he has been employed since graduation. Trust that "the wild and woolly West" won't keep Mac in that region forever, but that battleships will call him this way again.—H. L. Grant, XIII., is with the above concern and in the same department as Macpherson. Grant was formerly with the New York Shipbuilding Company.—R. W. Strout, II., is mechanical engineer with the Corwin Manufacturing Company, Peabody, Mass.—A. B. White, I., who is settled in Riverside, Cal., has been appointed city

engineer of Corona.—And still they come. Miss Louise Charlotte Lundberg, Frank David Chase, married Aug. 23, 1905, Minneapolis, Minn. At home after October 1, 1109 Hawthorne Avenue.—Miss Ruth Blanchard, Dr. Milton Weston Hall, married June 12, 1905, Hyde Park on Hudson, N.Y. We extend our congratulations to both couples.—Lewis A. Miller, I., is with the bridge and building department of the Pennsylvania Railroad, having headquarters at the Broad Street Station, Philadelphia. A rumor has floated up this way that he has an interesting matrimonial announcement in store, but thinks that a railroad man has no right to do such things, consequently we may expect a formal announcement some time in the near future. Meanwhile we extend our congratulations “on the quiet.”—P. R. Brooks, II., with the Railway Appliance Company in New York, has just returned from a successful two weeks’ cruise, as chief engineer, on the United States steamship “Dorothea,” with the Illinois Naval Reserve on the Great Lakes. He says that the government is chronically short of engineer officers, and the naval reserves of the various States offer very excellent opportunity for “Tech” men to show their patriotism. The results are more than commensurate with the time required. Also that “I am glad to see that the Massachusetts Supreme Court has scored a bull’s eye.” So say we all of us.—The following appeared in a late issue of the *Boston Herald*:—

Edward R. Robson, son of W. O. Robson, one of the most prominent men in the Royal Arcanum, recently had a narrow escape from death by yellow fever in Colon, Panama, to which place he went in the employ of the government last July. He came through it safely, however, and writes home to his parents that he is all the better off for his attack, being now immune from the plague of that southern climate.

Young Robson, whose home is with his parents in Wellesley Hills, is well known both there and in Boston for his athletic skill. He is twenty-six years old, of stalwart build, and a year ago was captain and star half-back of the Maugus A. A. football team. Later he played with M. I. T., being a member of the class of 1900.

The latter part of July he went to Panama, where he was given a position in the sanitary engineering department. There he has been living at the

best hotel in Cristobal, a suburb of Colon. He wrote home to his parents regularly, and when, in the latter part of August, they failed to receive a letter from him for over two weeks, they began to be alarmed. When, on August 29, W. O. Robson started for Ohio to attend the Royal Arcanum session there, he was still anxiously waiting a letter. Two days after Mr. Robson arrived at Put-in-Bay the news reached him.

The letter stated that three days after his son arrived in Cristobal a slight epidemic of yellow fever broke out there, and Edward was one of those stricken. His strong constitution stood him in good stead, however, for in the hospital he fought the disease off, and recovered from it in ten days.

At the hospital in Colon young Robson was told by the doctors that he owed his life to the fact that he does not touch alcoholic liquors.

Quite a number of persons caught the fever during the epidemic, which has not yet run itself out. Mr. and Mrs. Robson were greatly worried at first over their son's sickness, but now they are happy in knowing that there is practically no danger of his ever taking the disease again.

We are glad of Robson's recovery, and at the same time would extend a warning to some of "de gang" to keep away from Panama.—Walter Scott, II., is now settled in Lawrence, Mass., and is running a garage. He is local agent for a number of cars, and has had a successful season. He also, besides storing cars, has a repair shop in connection with the garage which, we imagine, has also had a successful season. Scott was formerly with the Locomobile people, and later was with Seaver, I., in Pittsburg. He recently took a trip through the White Mountains in one of his cars.—L. S. Smith, II., who has been instructor in the Mechanical Department at the Institute since graduation, has been spending the summer in North Conway and North Woodstock, N.H. The secretary ran across him unexpectedly in North Woodstock, camping with a party of Tech men. On one of their tramps among the mountains the merger proposition was argued on the top of Loon Pond Mountain with a Harvard man whom they met there. They had not heard of the court decision in regard to selling, and, when informed of the same, a shout went up that "shook the hills of old New Hampshire."—L. S. Keith, VI., connected with the New York Telephone Company, recently put in a number of weeks in Boston in connection

with some work for this concern. Keith is keeping bachelor apartments up-town in New York, and says that Boston has no attractions for him now.—H. Littlefield, VI., is agent for the General Electric Company in Nashville, Tenn. He also hath taken unto himself a wife.

1901.

E. B. BELCHER, *Sec.*, Malden, Mass.

H. P. McDonald, I., has severed his connection with The Smead & Co. Iron Works of Jersey City, and is engaged in draughting for the structural work of the Pennsylvania Railroad's Hudson River tunnel.—James P. Catlin is working for the General Electric Company at West Lynn, Mass.—W. G. Wildes is in charge of highway construction near Rockwell, N.Y.—After a three months' vacation, W. J. Sweetser has returned to his duties as professor of mechanical engineering at Mt. Allison University, Sackville, N.S.—Recent visitors to Boston from the steel district of Pennsylvania were E. J. Seaver, II., and W. Fred Davidson, II.—L. W. Horne, XIII., is returning to Washington, D.C., after a two months' leave of absence.—The engagement is announced of Charles J. Bacon, II., to Miss Harriet Boomfield, of Winthrop, Mass.—Harry W. Benson, II., has severed his connection with the Taunton Locomotive Works where he has been employed for several years as chief draughtsman.—Charles F. F. Campbell has for the last year had charge of the experiment station for the trade-training of the blind at Cambridge, Mass. The work has been so successful that the building in which the experiments have been conducted is taxed to its utmost, and the plant is soon to be enlarged. As a recognition of Mr. Campbell's service to the blind, the national organization, The American Association of Workers for the Blind, has elected him one of their vice-presidents.—The secretary wishes to call attention to the necessity of keeping him posted as to changes in address or occupation.

1902.

C. W. KELLOGG, JR., *Sec.*, Edison Electric Illuminating Company,
Brockton, Mass.

Class news has been very scarce during the past summer, a few weddings and engagements being the principal items of interest. Paul Hansen was married on Oct. 3, 1905, to Miss Alison May Scott, of Melrose Highlands, Mass.—Eames was married on the 7th of August to Miss Elizabeth Sutherland Stevens, of Swampscott, Mass. They will be at home after Oct. 1, 1905, at 20 Russell Road, West Somerville, Mass.—Cates was married in Salt Lake City, Utah, on September 12, to Miss Helen Mara Gillespie, of that city.—J. M. Egan, Jr., was married on October 11 to Miss Lottie May Pendill of Marquette, Mich.—W. H. Sears was married to Miss Edith Russell Teel of Arlington, Mass., on September 20. They will be at home after the first of December at 77 Bartlett Avenue, Arlington, Mass.—C. R. Place was married on the eighteenth of September, 1905, to Miss Mabel Hamilton Boyd of Hyde Park, Mass. They will be at home after December 1, at 524 West 162d Street, New York, N.Y.—It is reported that Stimson is engaged to Miss Boyier, of Pittsford, Vt.—C. S. Thomas, who left the Institute in January, 1902, has been leading a strenuous and successful life since leaving the Institute. Up to about a year ago he has held the successive positions of assistant mining engineer of the Camp Bird Mines at Ouray, Col., chief engineer of the Barstow M. and M. Company at Ironton, Col., and assayer and chemist with the Ouray Smelting Company. Last September he started with P. L. Marston the firm of Thomas & Marston, expert mining engineers and metallurgists, at Ouray, Col. He has been elected county surveyor of Ouray County, and has been retained as consulting engineer by the Atlas Mining and Milling Company.—B. G. Philbrick is leading the simple life at Little Falls, N.J., with the Filtration works of the East Jersey Water Company.—Horr is with the Compressed Steel Shafting Company, 393 Dorchester Avenue, Boston.—More has been pro-

moted to engineer of maintenance of way of the Michigan Division of the Big Four Railway.—C. F. Gardner is with Messrs. Curtis & Fletcher of 95 Milk Street, Boston, and is operating for them five electric light and gas companies in various parts of Maine and Vermont.—E. E. Nelson, who was last heard of by the secretary at the Institute as instructor in electrical engineering, went with Messrs. Stone & Webster of Boston on July 1. He is now at the International Light and Power Company, El Paso, Tex.—Carleton B. Allen has been in Baltimore, Md., during the past three months, assisting in the erection and testing of four 2,000 K. W. Turbo-Electric generators built by the Westinghouse Machine Company of Pittsburg, Pa., for the new generating plant of the local traction company.

1903.

W. H. ADAMS, *Sec.*, Polytechnic Institute of Brooklyn, Brooklyn, N. Y.

The secretary announces his marriage on August 9 to Miss A. Marguerite Horne, of Malden, Mass., and wishes to call attention to his change of address. For this next year he will be instructor in drawing and engineering at the Polytechnic Institute of Brooklyn, N. Y. Moving and getting married have kept him so busy that there is no class news, but he will try to make it up in the next issue.

1904.

CURRIER LANG, *Sec.*, Crafton, Pa.

“IN MEMORIAM”

JOHN ARTHUR FREMMER

Whereas an untimely death has taken from us our classmate, John Arthur Fremmer;

Whereas in his death the class of 1904 of the Massachusetts Institute of Technology has lost one of its foremost members, and one who gave great promise of a brilliant future,—

Be it Resolved, That we, the members of the class, extend our deepest sympathy to his family in their great loss; and

Be it further Resolved, That a copy of these resolutions be sent to his mother, that they be placed on the records of the class, and that they be published in the TECHNOLOGY REVIEW.

For the Class,

EDWARD FARNUM ROCKWOOD.

HENRY WARREN STEVENS.

BERNARD BLUM.

The past summer seems to have been a good one for some portions of the human family, even if Russia doesn't label it a howling success. The good brethren of our class have been moving around a little while the weather has been good, and the net result seems to be that they have improved their condition quite a bit, and laid in a little coal for the winter at the same time. The letters that have come in do not prove much, but their general tone shows that the class is making good. Salaries show this, too. The average of the salaries of forty-one members of the class, as stated by them at the Kommers held in Boston eight months or so ago, was \$750. The average for eleven of the members who are working in the Pittsburg district has just been found to be \$909. The number of voters was small in each case, and the localities were different, but the matter is worth mentioning.—G. E. Atkins has lately relieved the secretary's anxiety by sending along his dollar and a little account of himself. The letter was dated July 11 at San Francisco, and stated that Tommy had left the States in April and had just returned, after butting around China and Japan for three months on the Pacific mail steamship "Manchuria." He is now with the Globe Engineering Company of San Francisco, and can't seem to appreciate why the people out that way call California "God's country." The East for Tommy.—Lewellyn Bixby, I., is also in California, at Claremont, spending his time in reading law.—It begins to sound as though G. A. Fairfield was making things hum some down New York way. Listen to what he is,—a member of the Engineering Corps of the Rapid Transit Construction Company, on Section 2 of the East River Tunnel Division. Bunker Hill had the job be-

fore, but his health gave out from trying to tell his friends what he was doing.—A. C. Downes has made one shift since graduation, from the Hartford Laboratory Company to the National Carbon Company of Cleveland, Ohio. He is now a chemist for the latter concern, and the work is more general in character than before. With the same concern is Richardson, VIII. Downes left Hartford just after helping to start the Tech Club of that city, and now he and some older graduates are talking of starting a similar club in Cleveland.—J. C. Nyce is in the main sales department of the Bullock Electric Manufacturing Company of Cincinnati.—W. E. Hadley is at present foreman-superintendent of the galvanizing department of the National Tube Works, McKeesport, Pa.—A. W. Bee has been transferred from the Chicago Terminal Division of the Pennsylvania Lines, with headquarters in Chicago, to the Eastern Division of the Fort Wayne Route, with headquarters in Pittsburg.—Henry Kramer is with the Missouri Pacific Railway at St. Louis.—The last item of news, though not the least by far, according to Hill, is that E. T. Wood came nearly fifty miles to a '04 meeting in Pittsburg, and then ordered ginger ale every time.—There is one more matter that the secretary must take up before closing, with the idea of showing how difficult his position is and what abuse he must withstand. The following is the reply to a letter headed Crafton, Pa:—

CHILPANCINGO, GUERRERO, MEX., APARTADO II., June 7, '05.

You wherever you be,—

The idea to keep dunning a true and loyal member of the majestic class of '04 for a dollar! At heart no better member ever lived than the once Vice-Prex, at pocket-book more unfortunate, for how am I going to send you a dollar when, first of all, you write, "I am in Pittsburg." Well, I am in hell, but I have sense enough to put that it is the S. W. corner, and, if it had a range and township, I would put that, too. Second, how in — am I to get an American dollar? If two Mexican dollars will do you, I will send them; but my American capital is limited to uno centavo (1 cent). . . . I told you all about myself in my last letter, so haven't anything else to say except that, if you dun me again for that dollar, I'll break your neck when I see you.

P.S. (With dearest love.) Spent the past twenty-three days in the saddle. How's that?

1905

ROBERT H. W. LORD, *Sec.*, Foxboro, Mass.

Following are the positions held by the men of the class of 1905 at present time and their addresses:—

Fred. H. Abbott (VI.), 1138 Commonwealth Avenue, Brookline, Mass.
With Stone & Webster.

C. Robert Adams (I.), 23 Burr Street, Jamaica Plain, Mass.
Hydrographic Aid with United States Geological Survey.

Claude A. Anderson (XIII.), 116 Clinton Street, Cleveland, Ohio.
Draughtsman with A. M. Shipbuilding Company.

Albert C. Armstrong (III.), 60 State Street, Boston, Mass.
Clerk in Mercantile Trust Company.

Carlton E. Atwood (VI.), 415 Whitney Avenue, Wilksburg, Pa.
Apprentice with Westinghouse Electric Company.

John Ayer (I.), Belmont, Mass.
Assistant, M. I. T. Civil Engineering Department.

S. Henry Ayers (VII.), 6047 Ellis Avenue, Chicago, Ill.
Assistant in Bacteriology, University of Chicago.

Roy H. Allen (III.), P.O. Box 666, Leadville, Col.
Miner with Fryer Hill Mines Company.

Ira James Banash (VIII.), 5 Fayston Street, Roxbury, Mass.
Studying at the Institute.

William G. Ball (III.), 7 Otisfield Street, Roxbury, Mass.
Cashier, Boston Bundle Wood Company.

Jules Verne Barnd (III.), 18 Ellery Street, Cambridge, Mass.
Assistant in Analytical Chemistry at the Institute.

G. Herbert Barrows (IV.), 99 Somerset Avenue, Taunton, Mass.
Post-graduate Student at M. I. T.

Donald R. Battles (XIIIa.), United States Navy Yard, Boston, Mass.
Assistant Naval Constructor.

Married June 13, 1905, to Miss Edith P. Austin.

George G. Bay (II.), 511 First Avenue, Pittsburg, Pa.
Partner in firm of Hagar & Bay, Produce Commission.

James E. Barlow (I.), 274 Methuen Street, Lawrence, Mass.
Rodman with Charles River Basin Commission. Returns to the
Institute in October as Assistant in Civil Engineering.

William H. Beers (VII.), 556 Columbus Avenue, Boston, Mass.
Assistant to Professor Sedgwick.

Arthur F. Belding (II.), Box 121, Claremont, N.H.
With Sullivan Machinery Company.

Roland Bendann (V.), 2406 Eutaw Place, Baltimore, Md.
With David Bendann (Fine Arts).

Frederick G. Bennett (I.), Rome, N.Y.

Care E. Low, Resident Engineer Barge Canal, New York State Barge Canal. Rodman.

Walter G. Bent (X.), 21 Selya Terrace, Rochester, N.Y.

Research Chemist with Eastman Kodak Company.

Fritz C. Bickford (IV.).

Reader (Emerson College), or White Entertainment Bureau, Colonial Building, Boston.

Asa J. Biggs (IV.), 216 Institute Street, Jackson, Tenn.

Draughtsman with Bemis Brothers Bag Company.

R. C. Bisbee (V.), Bethel, Me.

With Leon Godchaux Company, Ltd., Chief Chemist Raerland (La.) Sugar House.

Paul A. Blair (IX.), 38 Park Row, New York City.

Managing Clerk with Houston & Houston, Patent Solicitors.

W. H. Blakeman (XIII.), 1032 Girard Avenue, Philadelphia.

Assistant Foreman, Hull Constructing Department, with William Cramp & Sons, S. & E. Building Company.

A. S. Boynton (II.), 268 Main Street, Groveland, Mass.

Machinist with Barber Colman Company.

Joseph H. Brown, Jr. (II.), Claremont, N.H.

With Sullivan Machinery Company.

James S. Brown (II.), 2760 Broderick Street, San Francisco, Cal.

Married Sept. 20, 1905, to Miss Mariguita N. Kirby.

Fred. E. Burdon (VI.), North Attleboro, Mass.

Electrician.

Walter Burns (V.), Doughty House, Millville, N.J.

With Millville Manufacturing Company, Chemist.

Eugene Burton (III.), 126 W. Sixth Street, Leadville, Col.

With Yak M. M. & T. Co., in Magnetic Separating Department.

Leonard T. Bushnell (II.), M. I. T., Boston, Mass.

Mr. Powers, No. 2.

Chester A. Butman (VIII.), Rockport, Mass.

Principal of the Grammar School at West Newbury, Mass.

Charles H. Clapp (III.), University of North Dakota.

Assistant State Geologist and Instructor in Mining Engineering and Metallurgy in North Dakota State University.

W. A. Clarke (XIII.), 30 Broad Street, Weymouth Mass.

Computer, Fore River Shipbuilding Company.

Max Cline (V.), 7 Marion Avenue, Glens Falls, N.Y.

Assistant Chemist, International Paper Company.

Edward M. Coffin (X.), 88 Altruria Street, Buffalo, N.Y.

With Lackawanna Steel Company, Rail Mill Department.

David Collins (Sp.), 469 South Terminal Station, Boston, Mass.

Rodman with N. Y., N. H. & H. R.R.

Married Oct. 25, 1904, to Marion S. Churchill.

- Charles R. Craig (Sp.), Concord, Mass.
With Concord Water and Sewer Department.
- Gorham Crosby (VIII.), Centreville, Mass.
Studying.
- Silas P. Cumming (II.), 183 Cross Street, Central Falls, R.I.
Civil Engineer with O. Perry Sarle.
- Carl E. Danforth (III.), 98 Cumberland Street, Bangor, Me.
- Sumner G. Davenport (IV.), 211 Main Street, Jamestown, N.Y.
Draughtsman with Art Metal Construction Company.
- Roswell Davis (XIII.), 104 Columbia Heights, Brooklyn, N.Y.
With Rapid Transit Subway Construction Company, Testing Power Plant, East River Division.
- A. Malcolm Dean (II.), 429 South Potomac Street, Hagerstown, Md.
With Pope Manufacturing Company, Experimental and Testing Department.
- James M. De Mallie (VI.), 371 W. 120th Street, New York City.
With Electric Storage Battery Company, Operating Department.
- Ward P. Delano, Jr. (IV.), 36 East 28th Street, New York City.
Draughtsman with F. A. Moore, Architect.
- H. W. Donald (III.), 30 Winder Street, Detroit, Mich.
With Tramgott Schmidt & Sons, Leather.
- Francis E. Drake, Jr. (II.), 50 N. 21st Street, Columbus, Ohio.
- Barry C. Eastham (VI.), Oswego, Ore.
Partner, Eastham X-ray Company.
- Frederick M. Eaton (V.), United States Geological Survey, Berkeley, Cal.
Chemist and Hydrographic Aid.
- George R. Eckel (IV.), 515 N. 4th Street, St. Joseph, Mo.
With E. J. Eckel, Architect.
- Walter G. Eichler (II.), 1231 Callowhill Street, Philadelphia, Pa.
With Lanston Monotype Machine Company.
- Herman Eisele (XIII.), 7 Belvidere Avenue, Cleveland, Ohio.
- Frank S. Elliott (III.), 3 Commonwealth Avenue, Gloucester, Mass.
Assistant Instructor at Tech.
- Charles A. Emerson, Jr. (XI.), 361 East Broad Street, Columbus, Ohio.
Assistant Engineer for the City of Columbus.
- Ralph D. Emerson (IV.), 6 Paine Street, Worcester, Mass.
Assistant Engineer with Stephen Codman, Architect.
- Ralph B. Fay (II.), Box 480, Schenectady, N.Y.
Draughtsman with General Electric Company.
- Andrew Fisher, Jr. (X.), 180 East River Street, Hyde Park, Mass.
Studying at Tech.
- Reginald Fitz (Sp.), 18 Arlington Street, Boston, Mass.
Student, Harvard Medical School.
- John H. Flynn, Jr. (II.), Administration Building, Ancon, Canal Zone,
Care Bureau of Machinery and Equipment. Draughtsman, Isthmian Canal Commission.

- Robert M. Folsom (X.), 30 Esmond Street, Dorchester, Mass.
Assistant to the Engineer, New England Gas and Coke Company.
- James F. Fouhy (I.), 21 Wall Street, Charlestown, Mass.
Studying at Tech.
- R. S. Foulds (IV.), 216 Morgan Street, Phoenixville, Pa.
Draughtsman, Phoenix Bridge Company.
- Robert Fowler (Sp.), 351 Burroughs Street, Jamaica Plain, Mass.
Advertising Agent for S. S. Pierce Co.
- Frederick J. Frazer (V.), Palo Alto, Cal.
With McKibben Furniture Company.
- Percy A. Goodale (Sp.), 10 Post-office Square, Boston.
Agency Superintendent of Preferred Acc. Ins. Company.
- Clarence E. Gage (II.), 8 Sherman Place, Woburn, Mass.
Assistant in Steam Laboratory at Tech.
- Arthur P. Gerry (II.), Franklin Falls, N.H.
- A. C. Gilbert (V.), 23 Edgehill Road, New Haven, Conn.
With Dr. Osborne, Chemist in Conn. Experiment Station.
- Walter K. Gillett (V.), 3014 Wells Street, Milwaukee, Wis.
Chemist with Pfister & Vogel Leather Company.
- Luther E. Gilmore (X.), 88 Altruria Street, South Buffalo, N.Y.
Chemist for Lackawanna Steel Company.
- J. T. Glidden (III.), 9 Ashton Place, Cambridge, Mass.
Assistant Instructor, M. I. T.
- Carl H. Graesser (II.), Plainfield, N.J.
Draughtsman, United Printing Machinery Company.
- Edwin S. Graham (III.), Graham, Tex.
Assayer and Surveyor for Mazeppa Cons. Gold Mining Company.
- Samuel A. Greeley (XI.), 170 Broadway, New York City.
With Herring & Fuller, Sanitary Engineers.
- Thomas McC. Gunn (XIII.), 119 Pembroke Street,
Chief Draughtsman, Quincy Quarries Company.
Married May 26, 1905, to Miss Mabel I. Reynolds.
- Ralph E. Hadley (I.), Union Station, Columbus, Ohio.
Assistant on Engineering Corps of Pennsylvania Lines west of Pittsburg.
- William Alden Hall (XIII.), North Easton, Mass.
Midshipman, United States Navy.
- Louis W. Hammett (IX.), 8 St. Botolph Street, Boston, Mass.
Reporter for Boston *Herald*.
- H. L. Hardy (III.), 201 Walnut Street, Manchester, N.H.
Rodman with B. & A. R.R.
- Willis F. Harrington (X.), Barksdale, Wis.
Works Chemist for Atlantic Manufacturing Company.
- Harold P. Hart (VI.), 110 Franklin Street, South Framingham, Mass.
Student at Tech.
- Harold B. Harvey (VI.), Lynnfield, Mass.
Studying at Institute.

Charles W. Hawkes, 15 Euclid Street, New Dorchester, Mass.
Student.

Myron Helprin (V.), 402 Richmond Terrace, New Brighton, Staten Island, N.Y.

Chemist for National Export and Commission Company.

Ervin B. Hill (IX.), 5502 Margaretta Street, Pittsburg, Pa.

With E. M. Hill Lumber Company.

E. L. Hill (II.), Lincoln, Ill.

With Chicago & Alton R.R. Motive Power Department.

P. E. Hinkley (II.), Portland, Me.

With S. D. Warren & Co., Paper Mills.

Carl A. Houck (I.), 97 High Street, Buffalo, N.Y.

Draughtsman with Buffalo Structural Steel Company.

William G. Houskeeper (II.), 410½ Colonial Apartments, Wilkinsburg, Penn.

Apprentice, Westinghouse Electric and Manufacturing Company.

Arthur H. Howland (IV.), 105 Gates Avenue, Brooklyn, N.Y.

Draughtsman, W. B. Tubby, Architect.

W. H. Humphrey (IV.), 50 Chestnut Avenue, Waterbury, Conn.

Architectural Draughtsman, Duveen & Co., New York City.

Franklin L. Hunt (II.), 19 Howard Street, Waltham, Mass.

Student at Tech.

Bertrand L. Johnson (III.), United States Geological Survey, Washington, D.C.

Hydrographic Aid, United States Geological Survey.

Charles H. Johnson (III.), 176 Federal Street, Boston, Mass.

Agent with Albert H. Curtis, New England Mutual Life.

Charles Wiswell Johnston (III.), Santa Maria del Oro, Est. de Durango, Mexico.

Assistant Manager of Smelting Works of Lustre Mining Company.

George B. Jones (II.), 4337 Washington Building, St. Louis, Mo.

Travelling in Europe.

William H. Keen (V.), 404-406 Locust Street, Philadelphia, Pa.

Assistant Chemist, Booth, Garrett & Blair.

Henry H. W. Keith (XIII.), Navy Yard C. & R. Department, Washington, D.C.

Assistant Draughtsman, Department of C. & R.

H. W. Kenway (II.), 85 Lombard Street, Newton, Mass.

Studying at Tech.

C. D. Klahr (II.), Clarion, Pa.

E. F. Kriegsman (I.), Columbus, Ohio.

Assistant on Engineering Corps, P., C. C. & St. L. Ry.

Sidney R. Lamb (II.), 1065 Merriwether Avenue, Memphis, Tenn.

Erecting Electric Elevators for the Livermore Foundry and Machine Company.

Marcia A. Lamphier (Sp.), 120 Hamilton Avenue, Lynn, Mass.

Teaching, English High School, Lynn.

- Maurice B. Landers (II.), 510 Seneca Street, South Bethlehem, Pa.
Draughtsman, Bethlehem Steel Company.
- Arthur W. Lawrence (Sp.), 348 Congress Street, Boston.
With W. H. McElwain Company, Salesman.
- Charles E. Leavitt (XIII.), Weymouth, Mass.
Company's Inspector on scout ships, Fore River Shipbuilding Company.
- Cecilia A. Lemner (Sp. VII.), Hingham, Mass.
Nurse, Carney Hospital.
- Henry F. Lewis (VIII.), Box 93, Toronto, Ont.
In business.
- Warren K. Lewis (X.), Otis Street, Newtonville, Mass.
Assistant in Industrial Chemistry, M. I. T.
- Ben E. Lindsley (III.), Dorchester, Col.
Assayer and Surveyor, Taylor Park Mining Company.
- C. Arthur Lord (I.), 522 South Main Street, Woonsocket, R.I.
Insurance Agent with Dwight C. Lord.
- Eugene Lombard (XIII.), Dedham, Mass.
Salesman with W. H. Cutler, Pearl Street, Boston.
- Norman Lombard (II.), 1805 Jefferson Street, Kansas City, Mo.
With Corn Belt Bank.
- Arthur C. Long (V.), Sharon, Mass.
Chemist, Boston Dairy Company.
- Roy F. Lovejoy (IX.), 813 Broadway, Lowell, Mass.
Clerk with D. Lovejoy & Son, Machine Knife Manufacturers.
- Elliott Lunn (VI.), Aberdeen, So. Dak., Care Aberdeen Mill Company.
Electrical Engineer with Western Electric Company.
- Harry M. Lynde (I.), 90 Taylor Street, Waltham, Mass.
Engineering Department, B. & A. R.R.
- Waldo V. Lyon, 15 Dey Street, New York.
With American Telephone and Telegraph Company.
- Wallace N. MacBriar (II.), 1510 Mt. Vernon Street, Philadelphia, Pa.
Apprentice, Baldwin Locomotive Works.
- Carlton H. Manter (IV.), Taunton, Mass.
Architect.
- Grosvenor DeW. Marcy (II.), Care George F. Westcott Company, Buffalo, N.Y.
Erecting Foreman with George F. Westcott.
- Charles B. Mayer (IV.), 235 Harrison Street, Brooklyn, N.Y.
Draughtsman, Empire Bridge Company.
- Marshall G. Meriam (II.), 240 West Newton Street, Boston.
Assistant in Mechanical Laboratory at Tech.
- Robert W. McLean (II.), 419 Cross Street, Malden, Mass.
Assistant Instructor, M. E. Laboratory at Tech.
- Edgar L. Meyer (Sp.), St. Georges, Bermuda.
Of the firm of W. E. Meyer & Co., Steamship Agents, Coal Merchants,
and Marine Engineers.

- John Alexander Meggison (II.), 353 Columbus Avenue, Boston, Mass.
Assistant Night Operator, Head Place Station of Edison Electric Illuminating Company of Boston.
- Elizabeth Middleton (VII.), 70 Howe Street, New Haven, Conn.
Teaching, New Haven High School.
- Ralph H. Nesmith (XIII.), 265 Washington Avenue, Brooklyn, N.Y.
Assistant Draughtsman, Steam Engineering Department, League Island Navy Yard, Pa.
- Samuel Bailey Newton (III.), Toppenish, Wash.
After November 1 address Sierra Madre, Cal., Irrigated Land Rancher.
- D. H. Nicholson (I.), 50 Spring Park Avenue, Jamaica Plain, Mass.
Rodman, N. Y., N. H. & H. R.R.
- Isadore Niditch (V.), Box 1233, Hartford, Conn.
Chemist, Hartford Laboratory Company.
- Herbert W. Olmsted, 18 Newbury Street, Roslindale, Mass.
Transitman, Charles River Basin Commission.
- Homer O. Page (II.), 32 State Street, Adrian, Mich.
Manager of Page Gas Engine Company.
- Galt F. Parsons (VI.), 64 N. 36th Street, Philadelphia, Pa.
Assistant Chief Draughtsman, Roberts Manufacturing Company.
- J. H. Payne (X.), 2 Magee Avenue, Rochester, N.Y.
Superintendent, Velox Coating Department, Eastman Kodak Company.
- L. M. Pease (II.), 611 Pitt Street, Wilksburg, Pa.
Special Apprentice, Westinghouse Air Brake Company.
Married Feb. 6, 1905, to Miss Elizabeth M. True.
- Grafton B. Perkins (V.), 203 Lafayette Street, Salem, Mass.
Assistant Advertising Manager, Henry Siegel Company.
- Frederick P. Poole (VI.), 194 North Pearl Street, Albany, N.Y.
With Consolidated Car Heating Company.
- D. P. Pousland (VI.), 8 Hancock Street, Salem, Mass.
In Testing Department of General Electric Company.
- George W. Prentiss, 2d (II.), 207 Elm Street, Holyoke, Mass.
With George W. Prentiss & Co., Wire Mill.
- Albert G. Prescott (II.), 14 Whitman Street, Dorchester, Mass.
With Stone & Webster, Boston.
- J. V. Rathbone (X.), The Rookery, Chicago, Ill.
Assistant Agency Manager of North American Acc. Ins. Company.
- Grace H. Raymond (Sp.), North Abington, Mass.
Stenographer of Regal Shoe Company, Incorporated.
- Jacob B. Reinhardt (I.), 92 Plymouth Avenue, Buffalo, N.Y.
Transitman with N. Y. C. & H. R. R.R.
- Waldemar S. Richmond (I.), Care The Widell Finley Company, Belle Fourche, So. Dak.
Civil Engineer with Widell Finley Co., Engineers and Contractors.
- Attwood E. Rippey (III.), 462 Harvard Street, Brookline, Mass.
Student at Tech.

- Carrol Rhodes (Sp.), North Reading, Mass.
 C. Borie Rhodes (VI.), Salem, Ore.
 With Citizens' Light and Traction Company.
 George I. Rhodes (VI.), 64 Chestnut Street, Andover, Mass.
 Assistant in E. E. Laboratory at Tech.
 Louis E. Robbe (I.), Engineering Department, American Sheet and Tin
 Plate Company, Frick Building, Pittsburg, Pa.
 Assistant Civil Engineer, American Sheet and Tin Plate Company.
 Hallet R. Robbins (I.), Care Townsend & Co., Chemulpo, Korea.
 Mining Engineer with Oriental Consolidated Mining Company.
 James E. Rogers (XIII.), 184 Van Alst Avenue, Long Island City, N.Y.
 Draughtsman, Sadler, Perkins & Field.
 Scott C. Rummels (VII.), 1100 North Meridian Street, Indianapolis, Ind.
 Student with Dr. O. S. Rummels.
 Ernest G. Schmeisser (VI.), 332 West 22d Street, New York City.
 In Transmission Department of N. Y. C. & H. R. R.R.
 Frederic J. Schwarz (VI.), Ballston Spa, N.Y.
 In Testing Department of General Electric Company.
 Samuel Shapira (III.), 32 Chambers Street, Boston.
 Studying at the Institute.
 Chester R. Shaw (VI.), Brockton, Mass.
 Assistant in Physics at Tech.
 Thomas Shaw (VI.), 188 Summer Street, Plymouth, Mass.
 Engineering Department of American Telephone and Telegraph Co.
 Abraham J. Silverman (III.), 36 Paris Street, East Boston, Mass.
 Travelling Salesman with Silverman & Co.
 Converse Smith (I.), 15 Tennis Street, Cleveland, Ohio.
 Assistant Engineer Corps, Pennsylvania Company.
 C. Huntington Smith (I.), 35 Adelbert Street, Cleveland, Ohio.
 Assistant Engineer N. Y. C. & St. L. R.R.
 Edward C. Smith (V.), The Buckland, Fremont, Ohio.
 Chemist at T. H. Works of National Carbon Company.
 S. A. Smith (VI.), 500 E. 6th Street, Jamestown, N.Y.
 Phillips Barrel Machine Company.
 William L. Spalding (III.), 1 Austin Street, Buffalo, N.Y.
 Chemist at Buffalo Smelting Works.
 F. O. Sprague (V.), 203 Main Street, Haverhill, Mass.
 Student at Tech.
 Zenas Carl Staples (III.), San Juan, Porto Rico.
 Book-keeper, West India Oil Company.
 Roger R. Stebbins (XIII.), 445 Washington Street, Quincy, Mass.
 Weighmaster of Electric Boat Company.
 Sidney T. Strickland (IV.), Hedge Road, Brookline, Mass.
 In Paris one year for special study.
 Married July 26, 1905, to Miss Elsie Rutan.
 Ralph E. Tarbett (XI.), Worcester Polytechnic Institute, Worcester, Mass.
 Private Assistant to Dr. Kinnicutt.

- Winfred A. Taylor (I.), 15 Allyn Place, Lawrence, Mass.
Engineering Department of American Telephone and Telegraph Co.
- George C. Thomas (II.), 143 Beach Street, Bridgeport, Conn.
Machinist with Coulter, McKenzie & Co.
- Leigh Adair Thompson (VI.), 40 Park Street, West Lynn, Mass.
Head Instructor of Universal Winding Development in General Electric Company.
- Lambert Thorp (V.), 512 Prospect Place, Avondale, Cincinnati, Ohio.
Student at Tech.
- William Topper (IV.), 48 W. 20th Street, New York City.
Office Assistant, Frederick A. Stokes Company.
- Gilbert S. Tower (XIII.), Cohasset, Mass.
Graduate Student at Tech.
- William O. Tuck (III.), 72 Edgewood Place, Cleveland, Ohio.
Assistant Chemist, Sherwin-Williams Paint Company.
- William Tufts (I.), 56 Dwight Street, Boston, Mass.
Graduate Student at Tech.
- Waldo Turner (VI.), 921 Frick Building, Pittsburg, Pa.
Foreman, Iron City Engineering Company.
- Harry W. Upham (IX.), 10 Blackstone Street, Worcester, Mass.
With Simplex Piano Player Company.
- Ida H. Vose (Sp.), East Walpole, Mass.
- H. Le Roy Walker (II.), 1231 Callowhill Street, Philadelphia, Pa.
With Lanston Monotype Machine Company.
- H. S. Walker, Jr. (I.), 2 North Cascade Avenue, Colorado Springs, Col.
- Raymond Ware (XIII.), 11 Sayward Street, Dorchester, Mass.
Studying at Tech.
- Frank DeW. Webster (II.), 1508 Michigan Avenue, Chicago, Ill.
With Marshall Field & Co., Wholesale Laces, Embroideries, etc.
- Percy L. Wells (I.), Empire, Canal Zone, Panama.
Engineer for Canal.
- Henry A. Wentworth (VIII.), 104 Chatham Street, Lynn, Mass.
Assistant, Electrical Engineering Department at Tech.
- Edith H. Wheeler (V.), 36 Union Park, Boston, Mass.
In Catalogue Department of Harvard College Library.
- Mildred F. Wheeler (VIII.), London House, Mount Hermon, Mass.
Teacher of Physics and Chemistry.
- Kilborn Whitman, Jr. (I.), 109 Walnut Avenue, Roxbury, Mass.
Assistant in Civil Engineering at Tech.
- A. L. Whitmarsh (II.), 39 Lenox Place, New Britain, Conn.
Mechanical Engineer with Russell & Erwin Manufacturing Company,
Manufacturers of Builders' Hardware.
- James B. Whitmore (II.), The Ashtabula, Suite 6, Cleveland, Ohio.
Draftsman with McGeorge & Sons, Engineers.
- John Aloysius White (I.), Corozal, Canal Zone, Isthmus of Panama.
Civil Engineer for United States Government.

Herbert M. Wilcox (X.), 77 Park Avenue, Orange, N.J.

Assistant to Division Manager, Gas Department, Public Service Company of New Jersey.

Ellis Gray Wood (II.), 27 Jason Street, Arlington, Mass.

Assistant Superintendent, Gifford-Wood Company, Ice Tool Manufacturers.

Married Aug. 29, 1905, to Miss Margaret Phillips True.

E. Earnest Woodbury (I.), 9 Northey Street, Salem, Mass.

Civil Engineer with Guy W. Ricker.

Alanson Phelps Wyman (IV.), 17 East Van Buren Street, Chicago, Ill.

Landscape Architect.

On August 11 circulars were sent to all members of the class. Any one not receiving the same will please report at once to the secretary.

The secretary has been unable to locate the following members of the class. Any one knowing their address will please advise the secretary at his earliest convenience:—

James L. Ackerson.

Elbridge Gerry Allen.

Godfrey B. Astell.

Campos A. Fuentes.

Roy F. Gale.

Errett McLeod Graham.

Earl F. Knowles.

Theodore A. Longuemare.

Andrew J. Lowndes.

James A. Murphy.

Edward DeW. Perry.

Percy H. Physeck.

Henry S. Pitts.

John F. Schofield.

Alfred D. Smith.

Henry S. Spaulding.

Albert O. True.

Albert W. Walker.

From the Rochester (N.Y.) *Herald* of July 27, 1905:—

Further particulars of the drowning of Frank Lamont Snow differ somewhat from the stories already published.

It seems that Hill and Snow had been sailing throughout the day in the yacht "Pickle," and were in the act of tying up at the moorings off Kidder's Point, about one hundred feet from the shore. Hill was at the tiller, with Snow in the prow of the boat making it firm to the moorings. Suddenly the latter lost hold of the dingy rope which he had in his hand, and the little craft began to drift out in the lake with the wind. The jib had then been taken off, and it was impossible to put out again after the dingy. Consequently, Snow volunteered to go in after it, as it had only drifted about twenty-five feet from the yacht. Hill watched him as he struck out, clad in his yachting clothes, and, as he was swimming strongly and gaining on the dingy, he turned and went into the cabin.

He came up from the cabin and went down again without having his attention attracted to Snow. When he came up a second time, he looked for him, and was surprised to find that the wind had carried the dingy out about three hundred yards from the boat and beyond Snow's reach. The latter had turned for the shore, and, as Hill looked, seemed to stop swimming and cry for help. As Hill is himself a poor swimmer, he saw at once that it was hopeless to attempt to swim to the rescue, and called to Snow to hold out while he went ashore after a boat. He accordingly plunged in and swam to the shore, but, when he was once more on land, Snow had gone down.

There was no boat near at hand, and, when one was at length procured and the rescuers had located the spot where Snow disappeared, he had been down more than thirty minutes. Dr. Gould, who was at the Point, was summoned at once, but pronounced the young man to be beyond all help. He graduated from the University of Rochester in 1903, being elected to the honors of Phi Beta Kappa, as well as winning several minor prizes. He was one of the most popular men in both institutions, and leaves a host of friends, both in college circles and outside. He had been engaged to enter business with the Westinghouse Company in Pittsburg in the fall.

NECROLOGY

FRANK H. CILLEY, '89

Many alumni of the Institute will be surprised and shocked to learn of the sudden and unexpected death, on October 5, of Mr. Frank H. Cilley, a graduate in the Department of Civil Engineering of the Institute in the class of 1889.

Mr. Cilley was born in Northfield, N.H., Oct. 5, 1869, and was, therefore, thirty-six years old to a day at the time of his death. He was the son of William H. and Ellen F. Cilley. His father was a civil engineer, and connected with the construction of the famous Lima & Oroya Railroad in Peru, as well as with other railroads.

Frank H. Cilley attended the Boston schools, and then entered the Institute in 1885, at the early age of sixteen. His record at the Institute was one of great brilliancy, and offered promise of a successful and useful career. After graduation he was engaged for a year as an assistant in civil engineering, after which he went to Europe, and pursued his studies there. He remained in Europe about four years, studying at the polytechnic schools in Zürich and Berlin, at the *École Nationale des Ponts et Chaussées* in Paris, and also at the University of Leipzig. He had early shown great interest in structural work and a great aptitude for it, especially for the more advanced portions of the theory. In Zürich, under Professor Ritter, and in Berlin, under Professor Müller-Breslau, he found ample opportunity for the exercise of his talents and for perfecting himself in the higher theory of the subject. At Leipzig he pursued the study of the higher mathematics. Returning to this country in 1896, he was engaged for some time with the Pencoyd Steel Company, near Philadelphia, in the structural department. In 1899 he became connected with the engineering corps of the Bridge Department of the City of New York, particularly with the work upon the new bridges across the East River, and it was he who made the detailed computations to check the stresses and the sizes which were used. This piece of work led him to an elaborate study of the theory

of suspension bridges and of statically indeterminate structures in general. He published in the *Technology Quarterly*, in 1897, a paper on "Some Fundamental Propositions relating to the Design of Frameworks"; and in the Transactions of the American Society of Civil Engineers, in 1900, a paper on "The Exact Design of Statically Indeterminate Frameworks; an Exposition of its Possibility, but Futility." The last paper consisted of a detailed discussion of one of the most abstruse points in structural mechanics, and, while probably read and understood by few engineers, was a distinct and valuable contribution to the literature of the subject. Mr. Cilley remained connected with the Department of Bridges of the City of New York until a short time before his death, when family reasons led him to return to Boston.

Mr. Cilley was a young man of very unusual gifts, and it may safely be said that he was one of the most brilliant students ever graduated from the Institute. His mind was very keen: he was extremely methodical and careful in his work, and his ability in the direction of mathematics and mechanics was extraordinary. His death in the very prime of life is a distinct loss to the engineering profession, for, had he lived, he would certainly have done still more valuable work. For some time before his death he had been engaged in the preparation of a work upon the theory of suspension bridges, taking account of many elements which are not generally included in the treatment of the subject. The manuscript of this work is left unfinished, but is to be put in form for publication and published at an early day.

In addition to his mental acquirements, Mr. Cilley was a young man of unusual personal charm. He had a high sense of honor and honesty, and chafed at some of the experiences met with in his business relations; but he was, nevertheless, cheerful, optimistic, and unselfish, and always ready to give a helping hand to those who needed it.

Mr. Cilley is survived by one brother, but he leaves behind him also hosts of friends who will never forget his personal attractions and his mental acquirements, and who will long cherish his memory.

G. F. SWAIN, '77.

THOMAS CRANE WALES, JR., '92

Thomas Crane Wales, Jr., died suddenly at Boothby Hospital, Boston, June 27, 1905, from the effects of an operation for appendicitis. He was born in Dorchester, Aug. 29, 1871, of a well known New England family.

His early education was received in the Boston public schools. As a boy, he displayed the same energy, determination, and ability which made his after-life such a success. He graduated from the English High School in June, 1888, and entered the Institute in September of the same year. During his course at the high school he won high honors in his studies, and served efficiently during the last year as colonel of the Boston School Regiment. On entering the Institute, he made electrical engineering his choice as a profession, and was graduated from that department in the year 1892. His work in the Institute was of high standard, and throughout the four years he was prominent in all the affairs of his class.

He became associated with the American Bell Telephone Company in 1892, immediately after his graduation from the Institute. After several years devoted to the development and perfection of many forms of apparatus employed in telephony, his attention was turned to the design and engineering of telephone central office equipments, including buildings, switchboards, and their appurtenances, and the study of operating conditions. During this period he was prominently connected with the development of the central battery type of switchboard, and figured in many patents covering details of central office equipments. In this way was laid the foundation of his close acquaintance with the technical problems of telephone engineering that so admirably served him in his later work.

In the latter portion of 1901 he became associated with the New England Telephone and Telegraph Company, at first as assistant electrical engineer, but shortly becoming superintendent of traffic. Not long thereafter he was appointed chief engineer, having jurisdiction over the development of the plant, including the proper provision for growth, and also caring for operating methods, equipment, and buildings. This required the organization and adminis-

tration of a large department; and in this and the subsequent prosecution of his work his broad theoretical training and acquaintance with telephone plants throughout the country peculiarly fitted him for meeting the complicated problems confronting a large operating telephone company.

His connection with the New England Company coincided with a period of remarkable growth in the telephone business, and his work was largely interwoven with the development of the company during this time.

Because of his sound judgment and technical skill he was constantly called in consultation with the executive and engineering officers of his own and other companies on matters often reaching beyond the strict province of engineering. Strength of character and excellent judgment were his predominant qualities; and, in view of the important responsibilities which he bore so brilliantly at his age, his future was of the brightest.

He earned general recognition among the most prominent men in the telephone field as an engineer of the highest standing, and his devotion to his duties undoubtedly led him to exertions taxing even his sturdy physique to an extent that was fully realized only when illness confronted him.

Oct. 3, 1896, he married Edith E. White, a daughter of R. H. White of this city, and his wife and two children survive him.

FREDERICK L. RHODES, '92.

CHARLES F. WALLACE, '92.